ELECTRICAL REVIEW

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8th October, 1948

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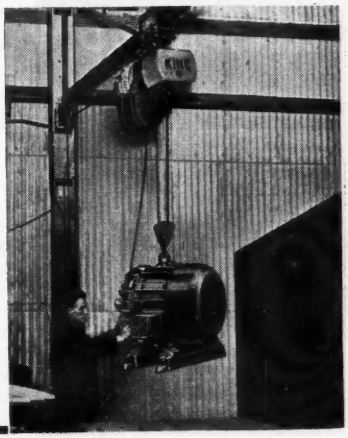

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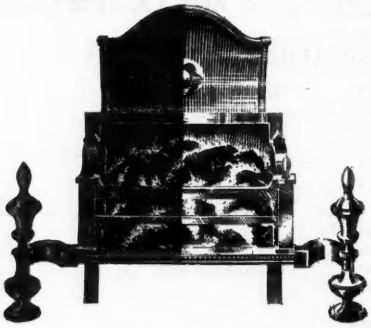

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ELECTRICAL REVIEW

THE OLDEST ELECTRICAL PAPER — ESTABLISHED 1872

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Nationalized Industries

WORKERS' VOICE IN THEIR CONTROL

IN 1947 the Trades Union Congress remitted to its Economic Committee a resolution calling upon the Government to set up joint administration boards for nationalized industries on which trade union representatives, elected by their membership, would sit in equal status with the management. After consideration the Economic Committee expressed the view in a report presented at this year's Congress that the establishment of such boards

> " would be destructive of the independence of the trade unions from the executive authority of the nationalized industries, and the unions would be compromised in their relationship with both the public boards and with their own members. Trade unionists elected or appointed to serve on a public board, but still owing ultimate responsibility to the union, would be in an embarrassing position, unsatisfactory to themselves, to the board, and to the workpeople concerned."

Fitness for Positions

From the trade unions' own point of view this attitude is understandable but there is a wider consideration than this, as the Economic Committee realized in a further statement that it would not be right to assume that the qualifications which fit a person for office in the trade union movement are always the same as the qualifications appropriate to a person holding a position of executive responsibility in an industrial undertaking.

We agree that there are people on the boards of private enterprises who have doubtful qualifications for their jobs but they are overwhelmingly outnumbered by those who *are* qualified or the " enterprises " would cease to exist. With a publicly owned industry or service the need for proper qualifications may not be so evident but even in this case a limit must be set to losses occasioned by misgovernment.

Views of the E.T.U.

The subject of workers' control is dealt with in the September issue of the *Electrical Trades Journal* (the official organ of the Electrical Trades Union). There is agreement with the views expressed by the Economic Committee " put in the context of the present policy and practice of nationalization." But, it is said, nationalization, as conceived at present, is not divorced from, but is a part of capitalism and the examples of the Bank of England and the coal industry are quoted as examples.

It is agreed by the *Journal* that the nationalized electricity supply industry contains a more representative personnel although there is as yet no provision for the participation of the workers in managerial control. The *Journal* goes on to say that " real workers' control and participation in management can be achieved . . . only by a radical change in the composition of the machinery of nationalization . . . and in the nature, purpose and scope of nationalization."

We do not understand what the last phrase means. The main argument for nationalization has always been that it would lead to better service and the cessation of " exploitation " of the public.

In the face of the considered opinion of the T.U.C. regarding the necessity for proper qualifications it is difficult to see how control by trade unionists (as such) would bring this about. The method adopted for the electricity supply industry of appointing a fair proportion of trade unionists to the Central Authority and Area Boards because of their knowledge and ability seems to be much more reasonable. The securing of fair wages and conditions for their members, which is the trade unions' real job, can be achieved by the recognized methods.

The foregoing considerations do not exclude the possibility of influence being exerted on management by trade unionists through works councils or committees, but this is not "workers' control" as envisaged by the E.T.U.

WINTER SURCHARGE

AFTER some delay, evidently due to misgivings, the British Electricity Authority has decided that the charge for electricity supplied on two-part tariffs shall be increased by 0·35d. per kWh during three winter months. In compensation for this the kWh charge for the other nine months of the year is to be reduced by 0·1d. This implements the only recommendation of the Clow Committee which was likely to have any immediate effect. What that effect will be remains to be seen, but the surcharge is hardly prohibitive—particularly to those to whom expense is no object—and economy will probably be exercised at other than peak times. It is an indiscriminate penalty, applying equally to those who depend almost entirely on electricity and those who have other means of space heating, water heating and cooking. In fact there is not much to be said in its favour. The only possible solution of the problem (apart from adequate power plant) is limitation of demand—an expensive and lengthy process.

PEAK RESPONSIBILITY

WHEN the overlapping of power and lighting demands at the latter end of winter afternoons ceased to be the main cause of system peaks, which now often occur at other times, the determination of peak responsibility became more difficult. About three years ago the Electrical Research Association devised a method of allocating, as between different classes of consumers, the standing costs of electricity supply (Technical Report K/T 109). The allocation was based on the highest demands during possible peak periods of individual component loads, the characteristics of which form the subject of a new Report, K/T 126. The latter gives much useful information, but as it relates to the unsettled conditions of 1945-46 it is likely to call for revision as soon as circumstances permit.

SCOTTISH POWER

BECAUSE the system of the North of Scotland Hydro-Electric Board must be self-supporting the Board has expressed its inability to supply power at a low enough price to enable electro-chemical and metallurgical industries to operate economically. It is suggested that these industries should apply for Government subsidies. On the other hand, the Scottish Council (Development and Industry) is submitting a scheme to the Government for providing power at an economic rate. Before the establishment of the Board, which was given a monopoly of Highlands water power, metallurgical industries were set up in Scotland which by producing their own power were able to carry on. Now, of course, the Board has to satisfy the demands of both industry and the public and to keep prices to the ordinary consumer down must charge the industries concerned higher rates than they can bear.

PURCHASE TAX SWITCHBACK

ARE electric warming pads and blankets domestic "soft furnishings" or bedding or are they electrical appliances? In their Purchase Tax Notice No. 78 of February last the Commissioners of Customs and Excise placed them among other electrical appliances, liable to tax at 50 per cent. When the extensive changes were made by the April Budget a new notice appeared (No 78L) in which warming pads and blankets were not specifically mentioned; later the Commissioners ruled, in spite of protests by the manufacturers, that they should be taxed at 66⅔ per cent under Group 5 which covers domestic soft furnishings and bedding. Now they have changed their minds and, once again, these pads and blankets are deemed to be electrical appliances taxable at 33⅓ per cent.

New Processing Dairy

Electricity's Essential Part in Milk Pasteurizing and Bottling

WE recently were able to pay a visit to the Milk Marketing Board's new dairy at Langley Bridge in Durham, where an essential part is played by electricity in the latest methods of pasteurizing and bottle washing and filling, and the electrical installation is of a high order. The dairy is the fifteenth to be established by the Board, and it is the first to have been designed, built and specially equipped to conform with the policy of the Ministry of Food which implies that in the near future only two types of milk will be recognized for marketing—tuberculin tested and heat treated.

The main single-storey building of the dairy is arranged with the milk-receiving bay and the A.P.V. pasteurizing plant on one side and the offices and laboratories on the other. Centrally from one end are arranged, on the straight-line production-flow principle, the empty-bottle receiving bay, the bottle-washing plant, the filling and capping machines, the cold store and finally at the opposite end the delivery bay.

At present something like 10,000 gallons of milk is received per day, mostly in ten-gallon churns transported by lorries and in 3,000-gallon two-compartment road tankers. The vehicles are sent out to collect the milk from the farms in a wide surrounding area.

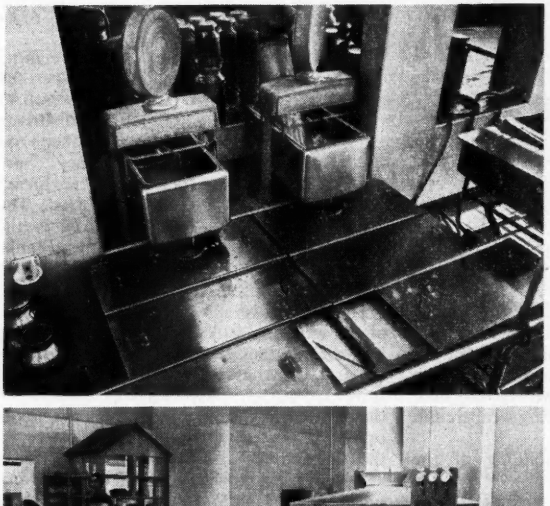
The churns are man-handled from the backs of the lorries and emptied into weighing machines which consist simply of specially shaped stainless-steel tanks suspended from Avery weighing machines. Then the churns are passed to a 5-h.p. motor-driven churn washer on which they are cleansed by steam and water jets. The milk received in the tankers is first pumped into storage tanks from which it flows to the processing plant when required.

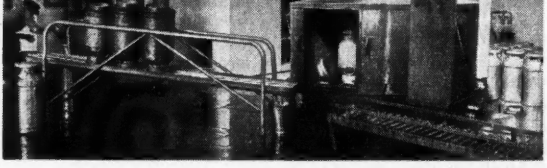
Hand-operated sluice valves in the bottoms of the weighing tanks allow the milk to flow into a large receiving tank a few feet below the level of the receiving bay, which level suits the lorries. At this stage samples of the milk from the various farmers are taken by the laboratory staff for determination of the fat content. The samples of milk, together with acids, are put into specially designed and graduated test tubes which are then placed in holders around a circular horizontal pan, each tube being disposed end-on from the periphery to the centre of the pan. The pan is rotated at a high speed by a small vertical motor directly under the centre of the pan. The acids dissolve all but the fat content of the milk, and under the centrifugal force the fat is lodged at one end of each tube where it is measured against the scale on the tube.

From the receiving tank the milk is first pumped into a float-control tank which acts as a flow-line reservoir, and then it is again pumped through the pasteurizing plant and up to the stainless-steel heat-insulated storage tanks on a gallery about 12 ft above ground level. A line of three 3,000-r.p.m. centrifugal

pumps, each directly driven by a 1½-h.p. Brook squirrel-cage motor under direct push-button and contactor control by G.E.C. self-contained units, includes one for pumping ordinary milk to the float-control tank, one for dealing similarly with T.T. milk, and a third for emptying the road tankers.

For pumping from the float-control tank through the pasteurizer and up to the storage tanks there are two 3-h.p., 2,500 r.p.m. centrifugal pumps, the complete unit in each case being covered in by a stainless-steel shield as protection during washing-down operations. All five pump motors are remotely controlled from a central control room and the pasteurizing plant, and the two larger motors may also be controlled locally from the control panel incorporating the milk " holding " section.





Churns are emptied into weighing pans and then passed to a washing machine

The general pasteurizing plant consists of a generation section in which the milk is first heated to 140 deg F; a filter section in which the fluid is forced through the fabric of bag containers; a heating section in which the temperature is raised to 162·5 deg F; a " holding " section in which the milk remains at this higher temperature for 15 seconds according to " regulations "; a flow diversion valve, i.e., a device which returns the milk to the generation section if the correct temperature has not been attained; and finally a cooling section in which the temperature is reduced to 36 deg F. With the exception of the " holding " section and the diversion valve all these components are arranged in one small pedestal-mounted unit, with the sections constructed on the condenser-tube principle, i.e., the milk is on one side of the " tube "—inside or outside—and the heating or cooling medium is on the other side.

The " holding " section and the diversion valve are incorporated in a separate pedestal-mounted unit of which an essential part is the pasteurizing plant control panel. It is on this panel that the local controls for the two larger pump motors are mounted. There are also two thermograph instruments on this panel for recording the temperatures of the heating and cooling mediums, respectively. The flow diversion valve is automatically operated by compressed air supplied by a motor-driven compressor and receiver unit housed in the remote control room.

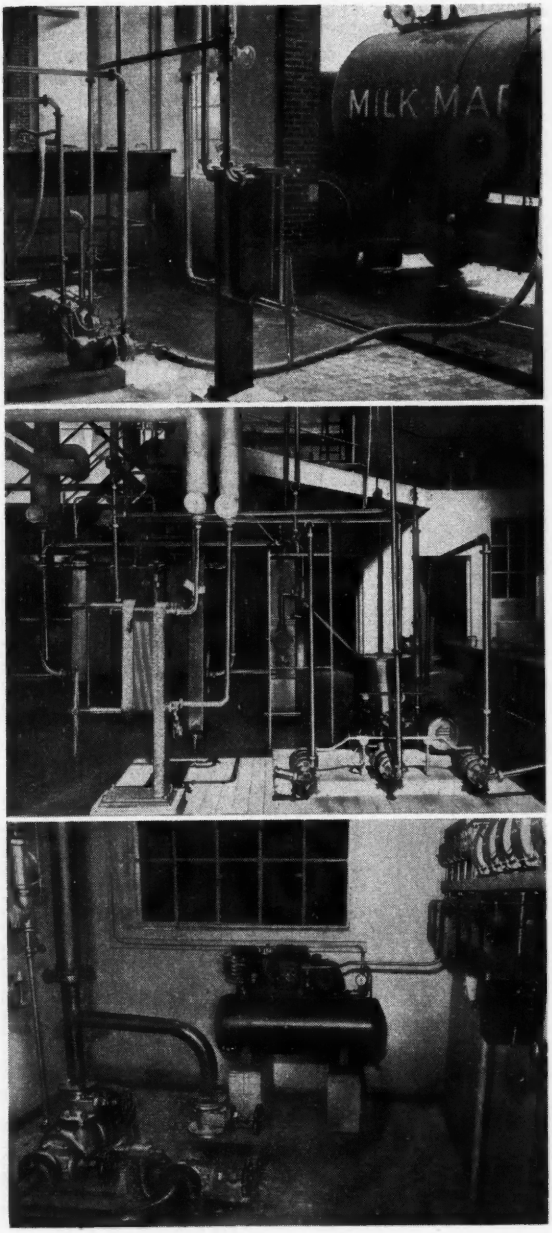
The heating is by hot water supplied indirectly by two 4,000-lb per hr, 80-lb per sq in. tube Cochran boilers, while the cooling medium is brine supplied from the refrigeration plant which also serves the milk cold-storage room. A 3-h.p. centrifugal pump in the remote control room circulates the hot water through the pasteurizer. There is also a smaller pasteurizing unit for dealing with T.T. milk when required. This is similar to the larger equipment and is also served by pumping plant already referred to.

New storage tanks are awaiting installation; the present working storage plant consists of

two 3,000-gallon and one 1,500-gallon tanks. To prevent the separation of the fat from the milk, the milk is kept in constant circulation during the storage periods by an agitator—a long shaft fitted with blades and running the length of and inside each horizontal tank, near the bottom. This shaft is rotated at 100 r.p.m. by a 1,200-r.p.m. Normand geared motor unit outside the tank.

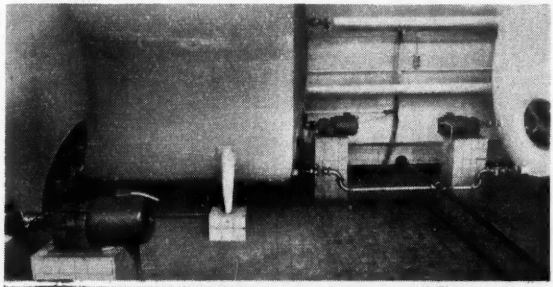
Milk from the storage tanks flows to the bottle-filling machines, but it is desirable to break the continuity of our story at this point in order to trace the journey of the bottles to these machines. Vans deliver the empty bottles in metal crates to the receiving bay. There are two identical flow lines throughout the central bottle-washing and filling section of the dairy. In each case the crates are placed on an endless-chain conveyor which takes them to the receiving end of the bottle washer. This conveyor is driven by a 2-h.p., 900-r.p.m. Brook squirrel-cage motor. Transmission is first through a 40-to-1 ratio speed-reducing "Radicon" unit, and then by chain, with a further speed reduction, to the driving sprocket wheel of the conveyor.

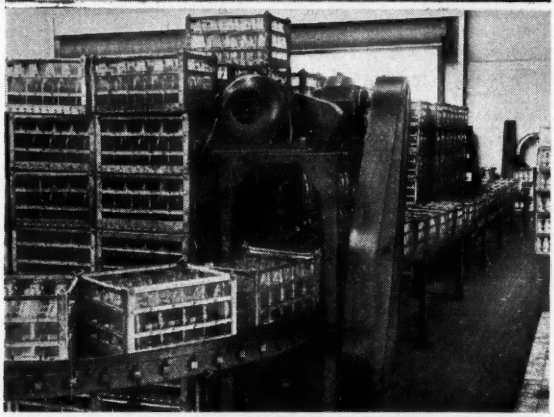
The bottle washer (U.D.

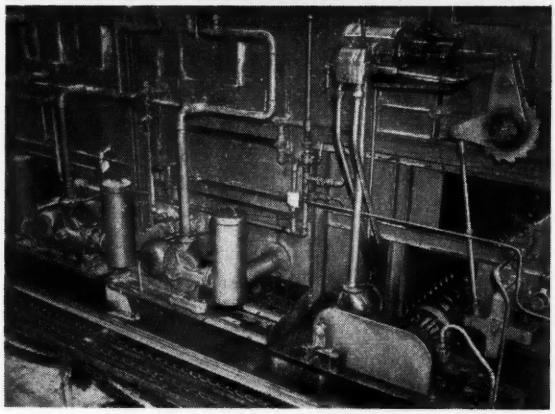


Top: Milk received in tankers is first pumped to a storage tank. Centre: The smaller pumps serve the float-control tank and the larger ones (stainless-steel cover removed from one motor) the storage tanks via the pasteurizers (left). Bottom: Milk-pump motors are remotely controlled; control room also houses air compressor for flow-diversion valve and pasteurizer hot-water pump

Engineering Co.), which is capable of cleansing 10,000 bottles an hour, has an enclosed metal chamber measuring 30 ft long, 10 ft wide and 6 ft deep. Inside the chamber is an endless conveyor incorporating rows, side-to-side, of bottle holders, the rows of holders virtually constituting links in the conveyor "chain." The bottles are hand placed into the holders at the receiving end of the washer and are carried through the chamber in an inverted position.





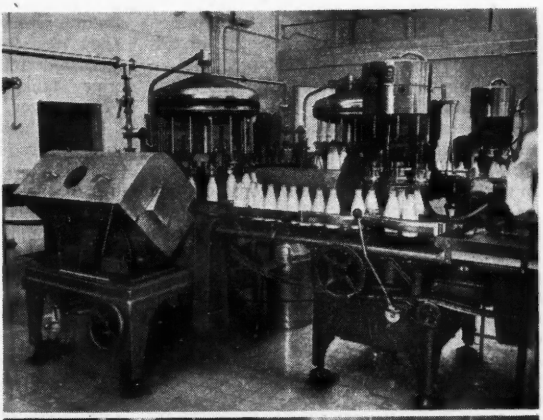


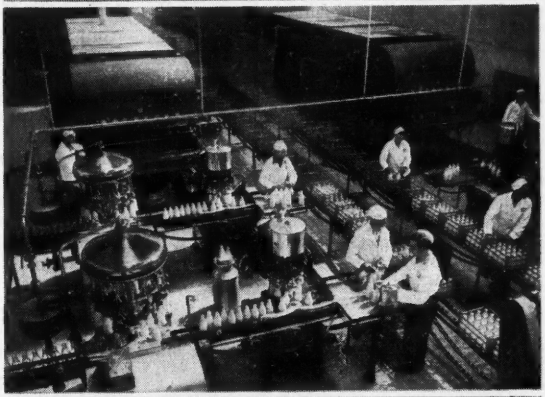
Top: Separation of fat in the milk-storage tanks is prevented by motor-driven agitators. Centre: Crates of empty bottles are carried to the bottle washer on a chain conveyor; driving end. Bottom: The bottle-washer internal conveyor is driven by a hydraulic unit with a motor-driven pump (right), and each jet is served by a motor-driven pump

The immediate drive for the conveyor is a hydraulic ram and cylinder unit, a convenient method because of the step-by-step movement of the conveyor. The speed of the conveyor can be varied by adjusting the stroke of the hydraulic unit. This is served by a 5-h.p. squirrel-cage motor-driven pump, with chain transmission, mounted on the side of the washer under the hydraulic unit. The motor is controlled by an Erskine Heap automatic contactor starter fitted with a tiny motor-driven rotor switch which puts the contactors first into "star" and then into "delta." The conveyor motor is also controlled for emergency stopping from three points along the conveyor by means of trip switches. As the bottles pass along the conveyor they are subjected to upward jets in three stages—first a detergent (caustic soda), secondly a warm rinsing and lastly a cold rinsing. The jets in each stage are produced by a 2½-h.p., 1,400-r.p.m. motor-driven centrifugal pump, transmission in each case being by even-ratio chain gear. The three pump motors are all con-

trolled from either end of the washing machine by Erskine Heap push-button contactor starters.

At the receiving end of the washer the empty crates are passed to another conveyor, similarly driven, alongside the washer which takes them up to the other end of the line where they are loaded with filled bottles. At the delivery end of the washer the bottles slide out, a row at a time, on to a narrow double-line conveyor which carries them along to one or other of two "Albro" filling machines. Surmounting each of these is a squat receiver into which the milk flows from the storage tanks. The bottles pass to a rotating table with fifteen seats. As each bottle leaves the loading station it is automatically raised a few inches, the mouth of the bottle being pushed up into a valve head pipe connected with the milk receiver above.





Top: Rotating members of the filling (left) and capping machines are motor driven; note combined air-compressor and vacuum-pump unit directly coupled to filling-machine motor. Centre: There are two flow lines through the central bottle-washing and filling section of the dairy. Bottom: Cold-store temperature is maintained at 35 deg F; coolers rear left and right

The result of valve operations in the head is that milk flows into the bottle during its passage round with the table and at the same time the air is drawn from the bottle by means of a vacuum line. Near the delivery point the bottle is lowered again and the valves are thus closed. A 2-h.p. motor on the filling machine drives the table, with belt transmission, as well as a branch bottle conveyor serving both the filling machine and the capping machine associated with it. Further, directly coupled to the motor is a small combined air-compressor and vacuum-pump unit. The compressed-air section provides, *inter alia*, for the lifting operations of the bottles, while the vacuum pump is connected to the valve head as indicated.

The filled bottles are passed along to an

adjacent "Alka" capping machine which has a similar rotating member, but in this case at one point a die head charged with an aluminium blank is lowered over the bottle mouth and the pressing operation forms the cap and seals the bottle mouth. The blanks are stamped out on the machine and are blown individually into the die head from an air line from the compressor on the filling machine. The rotating table on this machine also has a 2-h.p. drive which also serves uncoiling and re-coiling members for the aluminium strip from which the blanks are stamped, and the stamping operation. Both the filling- and capping-machine motors are controlled by G.E.C. push-button contactor units with thermal-overload devices. They both run constantly, however, the actual machine stop and start operations being effected mechanically under vacuum control. The loaded crates are passed to a cold store where they await collection by delivery vans.

The cold-store temperature is maintained at 35 deg F by means of two thermostatically controlled cooling units, each equipped with a brine coil and a 3-h.p. motor-driven fan which blows air over the coil and into the room. The brine coils are served from a tank in the compressor room, the brine in the tank being cooled by means of ammonia coils which are supplied from either of two compressors driven by 60-h.p. and 40-h.p. motors, respectively, which are controlled by Allen West two-step contactor starters. The vaporized ammonia from the coils in the brine tank passes on to a cooling "economizer" on the roof.

Under thermostatic control the following automatic sequence of operations takes place, through relays, on a specified rise of temperature of the brine. A brine-agitator motor starts up, then pump and fan motors serving the economizer, and finally either of the compressor motors. On a specified fall of temperature the sequence is reversed. On the brine tank are two 12·5-h.p. motor-driven pumps which circulate brine through the pasteurizers, and a 5-h.p. pump which serves the coolers in the cold store.

The complete electrical installation work was carried out by the North of England Engineering & Electrical Co., Ltd. The wiring throughout is v.i.r. cable in galvanized-steel conduit, and the specially constructed distribution boards incorporate M.E.M. switchfuse units mounted on angle-iron frames. A particularly interesting feature of these boards is the neat prefabricated cable trunks of about 2-in. square section.

We are indebted to the Milk Marketing Board for permission to visit the dairy and to publish this article, and to Mr. E. G. Phillips, the dairy manager, and his staff, for their co-operation.

Pension Regulations

EXERCISING the powers conferred on him by Section 54 of the Electricity Act, 1947, the Minister of Fuel and Power has made the Electricity (Pension Rights) Regulations, 1948 (S.I. 1948 No. 2172, H.M. Stationery Office, 3d.).

These Regulations contain the supplementary provisions necessary with regard to certain of the pension rights, as defined in the Electricity Act, 1947, which took effect as against Electricity Boards on the vesting date. They also relate to certain persons who assumed office before the vesting date.

Pension schemes confined to employees taken over are to be continued by the Electricity Board concerned. Schemes not confined to such employees, but which cover more than twenty-five persons taken over by any one Board are to be split, unless they are schemes financed by insurance. Pension schemes involving local government funds are also to be split. In the case of local government funds, and other schemes where the members are grouped, liabilities taken over include those in respect of existing pensioners whose service related to electricity as well as of persons still in employment. The Electricity Board concerned is to afford rights for persons taken over corresponding to those of the Act or scheme in question and is to receive payment of a sum equal to a proportionate part of the assets.

Apart from schemes in any of these categories, obligations taken over by the Electricity Boards will be discharged in accordance with the Act, subject to certain modifications.

Determination of the sums to be paid to Electricity Boards in respect of assets will be by actuarial valuation at the next periodical valuation of the scheme or fund. Expenses actually and necessarily incurred by the managers of the scheme or the local authority concerned will be refunded. Provision is also made for membership of Electricity Boards being treated for the purposes of schemes as service in the employment of the Board; for the disclaimer of rights created otherwise than in the ordinary course; and for the settlement of disputes.

The Regulations are made effective, in the case of persons who assumed office before vesting date, from the date of the passing of the 1947 Act, and in the case of other persons, from vesting date (1st April, 1948).

Views on the News

By REFLECTOR

STUDY of showrooms and shop windows provides a reliable indication not only of the present state of the domestic electrical appliance market but also of the general economic position. To the profusion of irons and kettles have recently been added a fairly large number of appliances which have been scarce or unobtainable since the war, such as washing machines, coffee percolators, refrigerators and hair-dryers. In general, however, these are made by the newer and less well-known firms and if products of the older and more experienced manufacturers are demanded there may still be a considerable delay in obtaining them.

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According to the *Nottingham Journal*, the Lord Mayor of Nottingham said recently that " a ton of coal in every home would put an end to the need for domestic electricity saving." This dictum has been challenged by Mr. H. E. Hutchins, secretary of the North Midland Regional Board for Industry. In his opinion since housewives have become accustomed to the cleanliness of electric stoves they would be reluctant to get up at 6.30 a.m. to light coal fires. " The electric fire at breakfast time has come to stay," he said. I am inclined to agree but also to add that breakfast should be early.

◆ ◆ ◆

It has been said that when electricity stops everything stops, but in Liverpool things begin to start. Press reports from that city say that when a fault occurred on the power system hundreds of burglar alarm bells were set ringing, keeping the police busy on fools' errands. I don't know what sort of alarms they have in Liverpool but this is the first case of the kind I have heard of.

◆ ◆ ◆

While cold weather is the enemy of the British Electricity Authority, in New York recently it was a heat wave which caused trouble to electricity suppliers. The Consolidated Edison Co. had a series of failures, principally in the leads of turbo-alternators, which were attributed to the excessive temperature. On the system of the Jersey Central Power & Light Co., a power failure was caused by two breaks in an overhead cable. This cable was varnished cambric insulated, lead covered and steel armoured. Heat expanded the armouring wire and the resultant torsion is said to have broken the cable at joints. The cable had been in service for about eighteen years.

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" Chicago System Caught with Generators Down " is a heading in a recent issue of the *Electrical World* (New York). The report tells of the Chicago Edison System's difficulties when it ran short of capacity in dull weather while 200,000 kW of plant was out for overhaul. Thirty-five large industrial consumers had to be appealed to and between them they " shed " 80,000 kW. Even this was not enough and the voltage was reduced by 10 per cent. Lights were dimmed and many elevators went out of action. It is perhaps cold comfort, but even in the most favoured United States things are not too easy in the power world.

◆ ◆ ◆

Judging by a report in the *Gloucestershire Echo*, the Midlands Electricity Board in setting up an electricity service centre in Cheltenham is to encroach upon establishments sacred and profane. In other words it is to occupy premises now in the possession of a Bible Depot and a firm of electrical contractors. The newspaper says that there is a possibility of opposition to the scheme by traders in the town.

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A representative of the Midlands Electricity Board told a meeting of the Walsall Chamber of Commerce last week that it was possible that oil stoves instead of electric heating apparatus might be used in the Board's offices during the coming winter. If this actually happens the Board will be putting itself in the position of the cobbler's children who are notoriously ill-shod.

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It is reported by the *Financial Times* that " electrical energy of 1,000,000 h.p., sufficient to supply a city with a population of 60,000 was released . . . at the official opening of the $12,000,000 Ontario hydro-electric generating plant on the Madawaska River." This must be a record for size and cost per h.p.

E.D.A. Functions

GATHERINGS IN SOUTHPORT AND BELFAST

THE North Western and Merseyside and North Wales Joint Committee of the British Electrical Development Association held its autumn conference at Southport on 28th and 29th September. The first day was reserved for the discussion of sales topics and the second for technical questions. Mr. P. Bregazzi, M.I.E.E., A.M.I.MECH.E., presided.

Miss Joan Whitgift, housecraft adviser to the London Electricity Board, read a paper on electricity as a service in the home and gave her impressions of the electrical trade in the United States. She described our own utility equipment as " not very inspiring " and added, " we should be able to produce equipment that fits our own market and still borrow from America their trick of making a thing look good." In the discussion, electric washers received much attention and some criticism. One member said that St. Helens had 400 names on its waiting list for £50 washing machines for homes where the husband earned about £6 per week. Another speaker declared that the ordinary household could not afford to pay 3-5 per cent of its weekly income on electrical equipment. Miss Whitgift rounded off the session by saying our equipment did not last as well as it formerly did and we must recover the lost position.

Mr. N. F. Phillips, E.D.A. exhibition organizer, read a paper on " Display with a Purpose." Mr. N. H. Bridge said the N.W. Board was trying to unearth the talent and ideas for displays from the districts and sub-areas. It was intended to establish an annual window-dressing competition for a Gibson Cup. (Alderman G. Gibson is chairman of the N.W. Electricity Board). Too much use was made of manufacturers' displays in showrooms and the Board had to be cautious about becoming identified with extravagant statements sometimes made by manufacturers.

Mr. J. Eccles, chairman of the Merseyside and North Wales Electricity Board, who presided at the luncheon, called for full recognition of human values. There must be scope for the exchange of views and opinions within the industry.

At the technical sessions, Mr. A. O. Johnson, B.SC., A.M.I.E.E., chief commercial officer, N.W. Board, read a paper on " Load Factor Improvement," He considered that the scope for improvement in this direction was very large and while there was a limit to the practical possibilities, there was still much the supply industry could do. Capital expenditure was now such an important consideration that every possibility of improving load factor should be immediately explored.

Mr. R. Harvey, B.SC., A.INST.P., manager of the E.D.A. Testing House, described " The Testing and Approval of Appliances " and the work of the Advisory Committee on Electrical Appliances and Accessories. He said it was never the intention to suggest improved designs to manufacturers, but merely to criticize those points which experience or tests had shown to be unsound. When the Testing House developed he hoped it would be possible to undertake development work based on their own researches, for the benefit of the industry as a whole.

Northern Ireland Lunch

ON 30th September the Northern Ireland Area Committee of E.D.A. gave a luncheon in honour of Mr. J. Eccles, chairman of the Council of E.D.A. Among the guests were Mr. V. W. Dale, general manager and secretary of the Association, Mr. H. S, Pocock, managing director of the *Electrical Review*, Mr. W. B. Maginess, Minister of Labour, the Mayor of Londonderry, the chairmen of the Belfast and Londonderry Corporation Electricity Departments and representatives of the Electricity Board for Northern Ireland.

Mr. R. V. Macrory, city electrical engineer of Londonderry, presiding in the absence of Mr. W. J. Girvan, chairman of the Committee, who had been called to London on business, proposed the toast of the guests, and extended a special welcome to Mr. Eccles who they were proud to claim as an Ulsterman by birth and upbringing. Mr. Macrory read the speech which Mr. Girvan was to have delivered, in the course of which he said that hitherto the Northern Ireland associations with E.D.A. had been of the happiest kind, and whatever the form of the ultimate reorganization of the Association, they hoped to have the privilege of a place in it. Mr. H. S. Pocock responded to the toast.

Mr. Maginess, in proposing the toast of the Association, complimented it on the work it had done in spreading the electrical idea. The number of persons using electricity in Northern Ireland was smaller than it should be, but the Government was determined, with the assistance of the industry, to see that development was speeded up.

Mr. Eccles, who replied, said that the work of the Association was to educate people in the realities of the present national situation and in the part electricity could play in helping them towards better times, and he was glad to know that Ulster was playing her full part. Electricity could make an important contribution in the battle for exports which could be waged for many years in the factory and on the farm. Fortunately in Ulster there was no shortage of generating plant, and he suggested that it be used to the full.

Commercial Motor Show

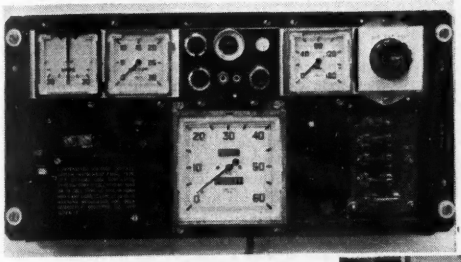
POST-WAR REVIVAL AT EARLS COURT

THE fourteenth exhibition in the biennial series organized by the British motor industry was opened on Friday last at Earls Court in London by Earl Mountbatten of Burma. It is the first exhibition of its kind to be held in this country since 1937 and so far as is known it is the only one in the world which is devoted entirely to commercial motor vehicle interests.

In view of the industry's extensive commitments abroad the main emphasis is on export and for this reason many of the vehicles shown are completely unfamiliar in appearance to the general British public.

In the vehicle sections, where all of the exhibits are of post-war design, 47 manufacturers are displaying between them some 450 different types, including trucks and vans ranging from 5 cwt to 22 tons capacity, coaches and omnibuses, trolley and electric vehicles, tractors, ambulances and a wide diversity of municipal and public utility vehicles.

"Beaver Junior" electric delivery vehicle



Smith's instrument panel

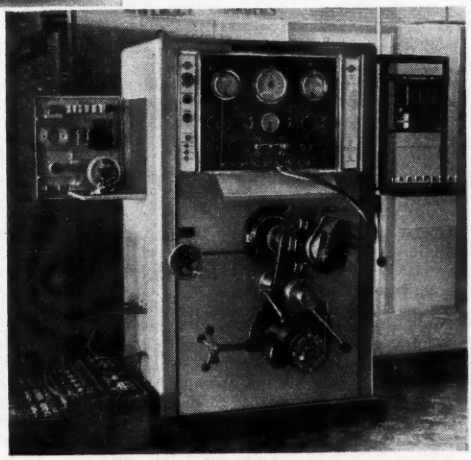
Incorporating diesel and petrol engines and battery electric power units they represent the widest variety of commercial motor vehicles ever assembled together at one time for public viewing.

To demonstrate the varied classes of work for which the battery electric vehicle is pre-eminently suited, Brush Coachwork, Ltd., is displaying a truly representative selection. The most outstanding of these is mounted on a Brush 2-ton battery electric chassis and is fitted for use as a greengrocer's shop with the addition of a fish counter. An example of a totally enclosed vehicle, which has been designed to comply with the Ministry of Food requirements, is an ice cream kiosk mounted on a three-wheeled "Pony" chassis. A 32-seater bus body is also shown mounted on a Leyland chassis built for the Yorkshire Traction Co., which is experimentally equipped with normal tungsten filament and fluorescent lighting with switches to isolate either system.

Another battery operated vehicle of some interest is the Wilson "Beaver Junior" baker's delivery van which is being manufactured under licence by Hindle Smart & Co., Ltd.

As would be expected at an exhibition of this nature, most of the well-known battery manufacturers are displaying their latest products. Although no striking changes in battery design are apparent, it is evident that many improvements in detail have been made in the light of wartime experience.

Typical batteries for bus and commercial vehicle use are shown by the Chloride Electrical Storage Co., Ltd.



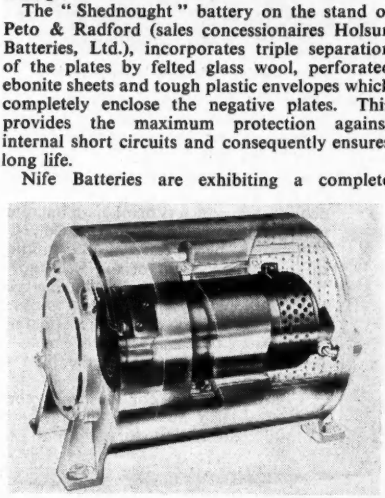
Crypton electrical test bench

Complete batteries assembled in hardwood trays or in monobloc containers of modern design are on view, together with batteries cut away to show the method of construction. Among the interesting features of these exhibits is a finger-tip topping-up device which eliminates filling difficulties, a new type of terminal connection as well as a shock-resistant ebonite container.

A full range of batteries for every type of public service and commercial vehicle is displayed by Oldham & Son, Ltd., together with battery booster plugs and sockets similar to those that are used as standard equipment by many of the large passenger transport undertakings.

The "Shednought" battery on the stand of Peto & Radford (sales concessionaires Holsun Batteries, Ltd.), incorporates triple separation of the plates by felted glass wool, perforated ebonite sheets and tough plastic envelopes which completely enclose the negative plates. This provides the maximum protection against internal short circuits and consequently ensures long life.

Nife Batteries are exhibiting a complete



C.A.V. convertor for fluorescent lighting

electric truck battery of nickel-cadmium alkaline cells of improved design, together with a trolley-bus battery. Special demonstration cells are on view as well as battery operated hand lamps for garage use.

An instrument panel for vehicle dashboards has been designed in an uncommon way by S. Smith & Sons (England) Ltd. It is so constructed that by undoing four thumbscrews the moulded panel can be removed to expose the panel wiring as well as the connections and instrument fixing screws. Access is thus made very much easier for servicing repairs than is usually the case with conventional arrangements.

On the stand of the English Electric Co., Ltd., an instrument is demonstrated which, by the utilization of cathode-ray tube and electronic techniques, facilitates the early diagnosis of every kind of spark plug fault. A full description of this instrument and its capabilities was given in the *Electrical Review*, 20th July, 1945, on p. 103. Wide and narrow gaps and insulation failure are easily detected, together with troubles arising from tracking in the distributor, contact-breaker faults or defects in the primary capacitor. The instrument can be used on engines with any number of cylinders and will operate on 6-, 12- or 24-V d.c. circuits. Once connected, the tube trace shows the complete firing cycle of the engine under test.

Apart from a full range of electrical service equipment shown by Crypton Equipment, Ltd., a comprehensive test rig is demonstrated which facilitates thorough testing of any piece of commercial vehicle rotating electrical equipment. This is likely to be of great use in large garages because, after repair, dynamos, magnetos, distributors and starters can be tested under a close approximation to road service conditions before installation in the vehicle.

Among the wide variety of garage and workshop equipment, visitors are afforded the opportunity of inspecting the complete range of portable electric tools manufactured by S. Wolf & Co., Ltd. Engine reconditioning equipment is prominent in this display, which includes precision valve refacers, valve seat grinders and the "Mobilectric" engine workshop.

Trolley-bus Exhibit

The modern trend of development in trolley-bus practice is admirably illustrated by a two-axle chassis on the stand of the Sunbeam Trolleybus Co., Ltd. This chassis has been specially designed for overseas use and is similar to large fleets now on order by the City of Brisbane and also the Adelaide Tramways Trust. A feature of this vehicle is that it incorporates the same system of auto-acceleration as another Sunbeam trolley-bus, which was described in detail on p. 517 of last week's issue of the *Electrical Review*. All of the electrical equipment units are readily accessible and particular attention has been paid to the simplification of maintenance problems. The brakes and doors are air operated, air pressure being supplied by a 10 cu ft/min compressor driven by a 1·8-h.p. motor. The electrical equipment is of B.T.H. manufacture and includes a floodproof traction motor, type 210, with a 24-V motor-generator set for the battery manœuvring equipment and illumination of the vehicle.

A demonstration of fluorescent lighting equipment for public service vehicles is given by C.A.V., Ltd., using a rotary convertor operating from a 24-V battery (see *Electrical Review*, 14th December, 1945, p. 873). The convertor runs at 8,000 r.p.m. and has a three-phase 380 c/s output of 430 W at 110 V. The frequency adopted enables resonant starting to be used, obviates the use of thermal starting switches and eliminates flicker. The convertor is housed in a rubber-mounted soundproof container, the complete unit weighing approximately 30 lb.

The exhibition closes to-morrow (Saturday).

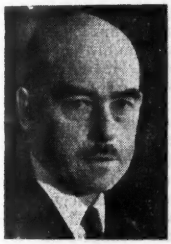
PERSONAL and SOCIAL

News of Men and Women of the Industry

THE Eastern Electricity Board has appointed **Mr. H. Brierley,** M.I.E.E., as liaison officer. Mr. Brierley was formerly the chief electrical engineer and manager of the Hampstead Electricity Department, and since vesting date he has been commercial officer of the North-Western Sub-Area of the London Electricity Board.

Recent appointments in the Central Gloucestershire Sub-Area of the Midlands Electricity Board include the following district engineers:—Mr. **W. R. Poole,** A.M.I.E.E. (Cheltenham), Mr. **R. C. Wilkinson,** ASSOCIATE I.E.E. (Gloucester), **Mr. L. Coulon** (Dean Forest), Mr. **C. R. King,** A.M.I.E.E. (Severn Vale—acting) and **Mr. E. L. Tapson,** A.M.I.E.E. (Stroud).

Sir Noel Ashbridge, F.K.C., B.SC.(ENG.), M.INST.C.E., M.I.E.E., Director of Technical Services with the B.B.C., has accepted the invitation of the Council to become president of the Junior Institution of Engineers for the 1948-49 Session.



Sir Noel Ashbridge

Mr. R. A. Riddles, C.B.E., retiring president, will induct Sir Noel Ashbridge at a meeting to be held at the Royal Society of Arts, John Adam Street, Adelphi, W.C.2, on 10th December next, when Sir Noel will deliver his presidential address entitled "New Developments in Broadcasting."

A Draft Model Code of Safety Regulations for Factories, prepared by the International Labour Office, is being considered at a conference which opened in Geneva on 27th September. The United Kingdom delegation includes **Mr. N. H. Jones,** Deputy Chief Inspector of Factories, Ministry of Labour and National Service, with **Mr. H. W. Swann,** O.B.E., M.I.E.E., Senior Electrical Inspector, Factory Department, Ministry of Labour and National Service, as one of his advisers.

Mr. G. H. Allwood, A.M.I.E.E., has now joined Scophony Ltd., Wells, Somerset, as motor design engineer. Mr. Allwood was previously engaged on development work with the Plessey Co. and before that was with English Electric Co., Ltd.

Mr. H. S. Beatty, A.C.A., formerly secretary of the Midland Counties Electric Supply Co., Ltd., has been appointed chief accountant of Balfour, Beatty & Co., Ltd. with effect from 1st October.

The Electric Construction Co., Ltd., announces that **Mr. G. W. Spencer Hawes,** O.B.E., chairman of the company, retired on 30th September for health reasons. **Mr. William Marter Furniss,** who has been associated

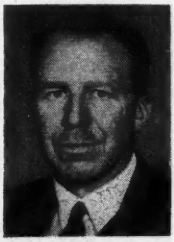
Mr. G. W. Spencer Hawes

Mr. W. M. Furniss

with the company for forty-five years, and has been managing director for the past six years, has been appointed to succeed Mr. Spencer Hawes as the chairman. **Mr. E. W. Walker,** A.M.I.MECH.E., who has been the Birmingham representative of the company for the last fourteen years, has been appointed a director as from 1st October.

Mr. S. Cutler, late sales manager of the Water Heater Department of the Simplex Electric Co., Ltd., has been appointed general manager with H. Fisher (Oldham), Ltd. **Mr. A. C. Hall,** late regional sales manager in Great Britain for Beatty Bros., Canada, has joined the sales organization of Fisher (Oldham), Ltd.

Mr. G. W. Molle, B.SC.(ENG.), A.M.I.E.E., who has been appointed chief engineer to the Bank of England, was educated at Bilton Grange and Tonbridge, and received his technical training at the City & Guilds Engineering College, South Kensington. After serving in the 1914-18 war, he was appointed assistant electrical engineer to the Madras & Southern Mahratta Railway, India, and returned to this country in 1924 to join as partner A. Hugh Seabrook & Partners, consulting engineers. From 1935 to 1939 he was area mechanical and electrical officer, Works Department, Air Ministry, following which he held positions with the War Office, the Admiralty, Preece, Cardew & Rider, and the Building Research Station,



Mr. G. W. Molle

Department of Scientific and Industrial Research, attached to the Codes of Practice secretariat. Since 1947 he has been engaged in private consulting practice. Mr. Molle was hon. secretary of the Overhead Lines Association from 1930 to 1933.

Mr. F. M. Bruce, M.SC., PH.D., A.M.I.E.E., A.INST.P., whose appointment as Professor of Electrical Engineering at the Royal Technical College, Glasgow, we reported in our last issue,

Dr. F. M. Bruce

studied at King's College, University of Durham (Newcastle-upon-Tyne), and subsequently carried out research work there as an external investigator for the British Electrical and Allied Industries Research Association on precision measurements at high voltages. In 1939 he obtained the Sir James Caird Senior Scholarship in Electricity and proceeded to Queen Mary College, University of London, to continue research work at high voltages. This work was interrupted by the war, during which Dr. Bruce was engaged on armament research. In 1946 he joined the Nelson Research Laboratories of the English Electric Co., Ltd., where for some time he has been in charge of short-circuit testing plant. Dr. Bruce was awarded the Mather Premium of the Institution of Electrical Engineers in 1947 for papers on high-voltage measurement. He takes up his new duties at the Royal Technical College, Glasgow as from the beginning of next month.

During his visit to Bristol to open the new headquarters of the South Western Electricity Board, **Lord Citrine,** chairman of the British Electricity Authority, inspected the power station at Portishead. In the accompanying picture we show him with members of the generation, operation and construction staff alongside the new 162,000 lb/hr boiler which he had just lit up for the first time.

Mr. A. S. Sutter, P.O. engineer in the Glasgow Telephone Area, has retired after forty-seven years' service.

Mr. L. Mellor, the new chairman of the North-Eastern Centre, of the Institution of Electrical Engineers, joined A. Reyrolle & Co. in 1904 and is still with that company. In 1911 he was appointed outside assistant manager in charge of construction and following the completion of early installations of 20-kV metalclad switchgear on the North-East Coast, he became responsible for the installation of h.v. and l.v. switchgear, transformers and associated cable connections at the Weston Point power station of the Salt Union Co. and the connected substations. This was the forerunner of the Mersey Power Co., Ltd., giving the first electricity supply to Runcorn and Widnes.

Mr. L. Mellor

In 1913 Mr. Mellor went to Madras in charge of construction of the switchgear and cable work at the Basin Bridge power station of the Madras Electric Supply Corporation. He returned to England in 1915 and was responsible for electrical replacements and repairs in battleships and cruisers on the Tyne. In 1916 he supervised the extensions at Neepsend power station, Sheffield, and the construction of the many substations and special equipments for the electric furnaces then being installed for the production of special steels. Since 1921 he has been responsible, as area manager, for all work in Northern England and Ireland.

Left to right: Mr. C. W. Clarkson (chief generation engineer (operation), South Western Division), Lord Citrine (chairman, B.E.A.), Mr. J. Irlam (generation engineer (construction), South Western Division) and Mr. D. P. Farrant (power station superintendent, Portishead), at the Portishead power station

Mr. J. M. Henderson, A.M.I.MECH.E., M.I.MAR.E., M.INST.F., has been elected national president of the Engineer Surveyors' Association for 1948-49. Mr. Henderson has been a mechanical engineer surveyor with the National Boiler & General Insurance Co., Ltd., for the past twenty-four years.

Mr. D. Ward, PH.D., has joined the Film Producers Guild, Ltd., as managing director of a new associate company which, subject to confirmation, will be called Technical and Scientific Films, Ltd. Dr. Ward recently completed the E.D.A. film "Clean Milk Production with Electricity."

Mr. R. C. S. Day, B.COM. has been appointed to the newly-created post of industrial liaison officer by Associated British Educational (British Instructional Films Ltd.).

Mr. K. B. Robinson, of the Steam Turbine Department of the English Electric Co., Ltd., Rugby, has been appointed efficiency and testing engineer with the British Electricity Authority, Yorkshire Division.

The address of **Mr. A. E. Morgan**, engineer to the North-Eastern Sub-Area of the London Electricity Board is now 84, Romford Road, Stratford, London, E.15.

Mr. Mungo Campbell will be installed as president of the North-East Coast Institution of Engineers and Shipbuilders at Newcastle on 15th October in succession to **Mr. H. B. R. Rowell**, of Hawthorn Leslie & Co., Ltd.

Mr. J. Parker, who was a representative of Smiths English Clocks, Ltd., before the war, has taken up the post of assistant sales manager. Mr. Parker has been away recuperating from the effects of his naval service.

Mr. H. P. Moss, controller of electricity supply, Commonwealth of Australia, and **Brigadier T. Murdoch**, deputy controller, recently retired upon the liquidation of the control organization. Mr. Moss became Commonwealth electrical engineer in 1913 and controller of electricity supply in 1942.

The works supervision staff of the **Hopkinson Electric Co., Ltd.**, held an outing on 25th September, when they travelled by coach from the Cardiff factory up the valleys to Brecon. After lunch at the Gremlin Hotel the party split up for a time and the town and its cathedral were explored. Later the party proceeded to Llangorse Lake. Returning to the Gremlin, tea was followed by a musical evening. The outing was organized by Mr. G. A. Sumpter, assistant works superintendent.

The Association of Past and Present Students of **W. H. Allen, Sons & Co., Ltd.**, is holding a reunion dinner in London on 27th November. Sir Richard W. Allen, president, will be in the chair. Present and potential members are asked to communicate with Mr. J. W. Boddy, hon. sec., c/o the company, Queen's Engineering Works, Bedford.

In connection with the recent formation of Philco (Overseas), Ltd. (a wholly owned British subsidiary of the Philco Corporation) for the purpose of distributing British-made Philco products overseas, **Major J. Vivian Holman**, A.F.R.AE.S., M.I.AE.S., has been lent by the Radio & Television Trust, Ltd., to the new company as acting managing director. In order to free himself for his new duties, Major Holman has resigned his RadioTel group appointments, which include managing director of Philco Radio & Television Corporation of Great Britain, Ltd. He retains his seat on the board of Radio & Television Trust, Ltd.

Major J. V. Holman

Obituary

Mr. R. Belfield.—The death occurred on 18th September at Whitehall, St. Peter's, Barbados, of Mr. Reginald Belfield, M.INST.C.E., M.I.E.E. Mr. Belfield had been a member of the Institution of Electrical Engineers for fifty years.

Mr. S. E. Garcke.—The death occurred at Hove on 3rd October of Mr. Sidney E. Garcke, C.B.E. Mr. Garcke was the son of the late Mr. Emil Garcke and chairman of the Electric & General Investment Co., Ltd., Dennis Bros., Ltd., Eastwoods, Ltd., and the Electrical Press, Ltd. He was also a director of the British Electric Traction Co., Ltd., and associated concerns. Mr. Garcke was sixty-three.

Wills.—Mr. A. K. T. Smith, of Worsley Lodge, Braishfield, Romsey, Hants, electrical engineer, who died on 21st May last, left £2,636 gross (£2,596 net).

Mr. B. Snowball, B.SC., A.M.I.E.E., late of W. T. Henley's Telegraph Works Co., Ltd., who died on 4th April last, left £3,547 gross (£3,460 net).

Electrical Industries Benevolent Association

THE demand for tickets for the E.I.B.A. Ball (Grosvenor House, 12th November) has greatly exceeded the supply and consequently no further applications can be entertained.

A luncheon and general meeting of the Birmingham Area Branch of the Electrical Industries Benevolent Association will be held on 14th October at the Midland Hotel, Birmingham. The chief speaker will be Mr. A. G. Beaver, president, E.I.B.A., and Mr. H. Senior Fothergill, secretary, will be present to answer questions on the organization. Tickets, 15s. each, can be obtained from Mr. L. Wall, Electrical Components, Ltd., 102, Snow Hill, Birmingham, 4.

E.R.A. Reports

Variety of Studies

THE following technical reports have been issued by the British Electrical and Allied Industries Research Association, 15, Savoy Street, London, W.C.2, at the post-free prices given in each case:—

K/T 126: "Load Characteristics of the Principal Classes of Consumers" (Interim Report) by P. Schiller and F. H. Dennis, 9s. 3d.; this provides supporting material for the E.R.A. method of allocating the demand-related portion of the standing costs of supply. N/T 44: "Magnetization Curves for Ferro-magnetic Single Crystals" by H. Lawton and K. H. Stewart, 12s. 3d.; the curves are derived on the basis of the domain theory for finite specimens with the field applied in an arbitrary direction in respect of the crystal axes. O/T 2: "Electrolysis and the Bond Strength of Reinforced Concrete—the Effect of D.C.", 6s. 3d.; the increase in load strength found with d.c. cathodic electrolysis (see F/T 168) appears to be entirely due to great adhesion between the reinforcement and the concrete. Y/T 11: "The Thermal Characteristics of a Concrete Floor Heated by Buried Cables" by M. V. Griffith, 7s. 10d.; the high thermal capacity of the floor makes it suitable for off-peak use, but the high floor temperature needed for comfort (65 deg F) restrict its suitability to background heating (55 deg F), except possibly where insulation of walls and ceilings is very high.

European Power Production

O.E.E.C. Development Programme

IT is stated in a bulletin issued by the Economic Co-operation Administration Mission to the United Kingdom that the Organization for European Economic Co-operation is now working on a comprehensive power development programme to meet the present electricity shortage. When these plans are realized, it is estimated that the total increase in power generating capacity by 1951 or shortly thereafter will be 23,751,000 kW, an expansion of 49 per cent over the 1947 figure.

The programme is planned to make the greatest possible use of hydro-electric power, in order to economize in the use of coal. Plant construction is already under way in several E.R.P. countries. Plans for the expansion of power generating capacity within individual countries provide for the installation of 21,445,000 kW of plant. In addition, several international projects, designed to step up the flow of power across national boundaries, will call for the installation of 2,306,000 kW.

Although United States electrical equipment manufacturers have a "backlog" of $500 million in orders placed by American utilities, they are giving special consideration to the needs of the E.R.P. countries. Exports of electrical machinery from America to the world, including E.R.P. countries, are estimated at $50 million dollars a month.

The experience of outstanding American power experts is being utilized to assist the E.R.P. countries in fulfilling their power programme. Mr. Walker L. Cisler, an operating executive of a leading Middle Western utility company, has joined the E.C.A. staff in Washington as power consultant. Mr. C. W. De Forest, who has been working closely with the O.E.E.C. on its power development plans, was for many years chief engineer of a large U.S. utility system, and for fifteen months was chief of public utilities in the U.S. Zone in Germany.

Proposed additions to the power plant capacity in the countries concerned from 1948 through 1951 or shortly thereafter are tabulated in the bulletin. From this it appears that Great Britain's expected contribution is 6,438,000 kW; that of Western Germany 4,982,000 kW; that of Italy 2,500,000 kW; and that of France 2,200,000 kW.

B.E.A. Welfare Officers

THE British Electricity Authority is inviting applications for three posts as administrative officers in the Labour Relations (Welfare) Department at its headquarters in London. Applicants are expected to have had a wide experience of personnel management and industrial welfare and to be capable of advising on one or more of the following branches:—Industrial catering and canteen management, organization of social and sports activities, lay-out of sports grounds and social club premises, personal welfare services, administration of benevolent funds and savings schemes. The salary offered is on a scale of £900, rising annually by £35 to £1,250 in the case of men, and £800 rising annually by £35 to £1,100 for women. Applications are to be sent to the Director of Establishments, British Electricity House, Great Portland Street, W.1, by 15th October.

Radio for Light Aircraft

A FIVE-CHANNEL lightweight v.h.f. transmitter/receiver claimed to be the first multi-channel set to be produced for use in light aircraft has been developed by the Plessey Co., Ltd., Ilford, Essex, to enable both the private flyer and the small charter aircraft owner to meet all expected official regulations for two-way radio communication. A lightweight m.f. broadcast and h.f. receiver has also been developed with simple direction finding facilities on m.f. and broadcast, combined with an h.f. transmitter to provide all communication and navigational facilities essential to light aircraft.

Pulverizer Performance

Comparison of Three Types of Mill

By V. SMITH

THE quantity of coal dealt with by a single pulverizer during its lifetime may run into many hundreds of thousands of tons. Efficiency and economy in operation, which includes considerations of power consumption, performance consistency and maintenance charges, as well as first cost and depreciation are therefore of the utmost importance, but data are not readily available upon which performance may be checked and comparisons made between different types of equipment.

According to Dr. Heywood in his paper to the Pulverized Fuel Conference at Harrogate (Institute of Fuel) no comprehensive research appears to have been carried out on the prediction of pulverizer performance, though he added that doubtless the manufacturers were able to make predictions based on their own experience.

Manufacturers hesitate to broadcast information which may lead to comparisons between their products and those of competitors. In some cases, moreover, they do not possess the requisite information owing to lack of test and operating data. There is, furthermore, a tendency to stress the advantages of particular types of mill, so the deductions may be misleading. However, examination of the salient features of design enables fairly close conclusions to be reached on the respective merits of the different types.

Three Types Considered

With a view to drawing attention to the more important fundamentals of cost and performance, the following three types are considered:—

A. The low-speed horizontal-axis ball mill, containing a heavy charge of small loose balls which pulverize the coal by a cascade effect as the drum rotates; first cost and power consumption are usually high, but maintenance costs are low.

B. The medium-speed vertical-axis ball or roller mill, containing a number of large ball or roller elements constrained to move in a horizontal circular path; the coal is ground between these elements and the race or bowl in which they rotate; power consumption and maintenance are reasonably low.

C. The high-speed horizontal-axis beater mill, consisting of one or more rows of hammers, paddles or beaters rotating inside a casing, which reduce the coal by impact; first cost is low but maintenance is high, while the power consumption usually falls between those of types A and B.

Any comparison between these and other types must take into account capital charges and depreciation; performance, namely the ability to maintain high pulverizing efficiency and to deliver a consistent product of the necessary fineness for the fuel to be used; ease and cost of maintenance; power consumption.

First Cost

The best equipment is generally the cheapest in the long run, although its first cost may be high. Comparisons of first cost are sometimes difficult, especially if the equipment forms part of a complete boiler or furnace installation. Although one type of equipment may not be strictly comparable with another, a careful analysis of each offer will generally reveal the desired information.

Prices should be for complete installations, which should include mills, exhausters, classifiers, magnetic separators (where required), feeders, trunkings, burners, motors and starters. Account should be taken of the greater proportion of stand-by capacity called for by types that need frequent maintenance; spare capacity may be unnecessary if the maintenance required is infrequent. Again, pulverizers of inherently low capacity may involve a considerable number of individual mills for a given total output, whereas only one or two units of another type may be required. In the former case an item sometimes overlooked is the duplication, not only of the mills themselves, but of motors, starters, cabling, switchgear and controls (automatic or other), which greatly affects not only first cost but subsequent servicing.

The following details should be supplied by the purchaser when calling for competitive bids on the requisite uniform basis:—Total capacity of plant (tons of fuel per hour); type, source, analysis and general characteristics of fuel; grindability and free moisture content of fuel; temperature of combustion air; sizing of fuel; and fineness of grinding required.

Total capacity does not present any particular problem, being dependent on the calorific value of the fuel and the expected efficiency of combustion, but a margin for deterioration of quality must be allowed in order to give the mills a suitable reserve capacity.

Grindability exercises an enormous effect on mill output, but there is much vagueness on the subject. A pulverizer will normally handle three to four times the amount of high-grindability as of low-grindability coal to furnish the same degree of fineness. Unless the coal grindability is known, the selection of a suitable size of mill can only be a guess. Machines are on the market for ascertaining grindability of any coal, within satisfactory limits of commercial accuracy.

Effect of Moisture Content

The capacity of most pulverizers begins to be affected with a moisture content around 5 per cent. With 10 per cent moisture, using cold air, the capacity can be reduced that much; thereafter the effect rapidly increases until the capacity frequently becomes zero, due to clogging, with a moisture content not much over 15 per cent. The hotter the air the greater becomes the capacity for a given moisture content, but zero capacity still occurs, though at a somewhat higher moisture figure. Moreover, heating the air still more has a diminishing effect, until a point is reached where further heating does not pay.

Coal sizing or grading also affects capacity, so that feeding coal of, say, ¾ in. maximum ring size instead of 2½ in. often increases the capacity by 50 per cent.

No pulverizer performance figures are complete unless the required fineness of the product has been stated. Coarse grinding can cause a large drop in efficiency, due to unburnt carbon loss and slagging trouble, leading to boiler outages. Different coals need different degrees of fineness for efficient combustion. Some burn well with moderate fineness, whereas anthracite, for instance, must be finely ground.

Manufacturers' Guarantees

Having decided on the performance, two difficulties still confront the user. In the first place, he cannot be sure that he will eventually get the coal on which his estimates have been based. His main safeguard here is to specify a fuel of a rather worse quality than the worst samples and a fineness figure of, say, not less than 75 per cent through 200 mesh.

The second point is whether the plants offered by the various makers will be found capable of reaching the desired standards of performance. While a number of manufacturers are fully capable of guaranteeing performances in respect of capacity, fineness, power consumption and maintenance, not all are so placed. Exaggerated claims regarding pulverizer performance are still made, not deliberately but from an insufficiently wide working experience of different types of fuel and lack of reliable test data.

In the United States, the wider experience of pulverized-fuel firing and the greater amount of data available on coal characteristics as compared with Great Britain, permit of closer selection of pulverizing equipment. The grindability figures of most coals are listed and from experience most manufacturers know to close limits what performance to expect from any particular coal.

In this country the "know-how" is more restricted, and whilst certain makers give reliable undertakings, there have been instances of failure of pulverizing equipment to come up to expectations in one respect or another. However, the user who makes a careful check on the lines suggested should not go far wrong in selecting equipment capable of the desired output.

Maintenance Costs

Pulverizer maintenance is usually expressed in terms of cost per ton ground. Collected figures show differences of up to 7 to 1 for different types of pulverizer working under similar conditions.

The wear of pulverizing elements is usually the heaviest, whether they be hammers, balls or rollers, but wear also occurs on mill linings, exhauster-fan blades and linings and in the fuel trunkings. Actual figures are difficult to obtain, but costs published in the United States show that whereas the maintenance cost of a low-speed ball mill might be about 1d. per ton, the corresponding cost in the case of a high-speed beater mill working on the same coal might be 3d. per ton. Medium-speed mills return about 2d. per ton. These figures include the cost of replacements and the labour necessary to install them.

Although the first cost and power consumption of the various types of high-speed mill may be reasonably low, the extra cost of maintenance may overbalance the

amortized higher capital cost and power charges of the low-speed mill.

It should be emphasized that the above figures are merely representative. In special cases the cost may vary considerably up or down and with very abrasive materials, such as coke or coke breeze, it has exceeded that of normal coal some twenty or thirty times.

Power Consumption

Power consumption ranges from 12 to 24 kWh per ton ground in average conditions, but can be much greater in special cases, increasing with fineness and moisture content. The figures quoted are for mills in good condition and any attempt to maintain output with worn elements may demand extra power, particularly with high-speed mills. Low-speed ball mills are affected to a much smaller degree by ball wear and show a consistent performance and steady power consumption over long periods.

No up-to-date and comprehensive costs having been published in respect of pulverizer performance, the following figures have been compiled to indicate general trends, with the intention of bringing out some of the more significant factors, rather than as a hard-and-fast summary of comparative costs. With these figures as a guide, the user should be able to compute working costs for different types of equipment.

The case will be taken of a 300,000 lb per hr (136,000 kg/hr) boiler consuming 15 tons of coal per hour, with the following alternative pulverizer equipments:—

A. Low-speed ball mills, say two mills of 7·5 tons per hour capacity each, with one standby mill. Assumed cost £10,000 per mill, total cost £30,000.

B. Medium-speed ball or roller mills, say three mills of 5 tons per hour capacity each, with one stand-by mill. Assumed cost £6,000 per mill, total cost £24,000.

C. High-speed beater mills, say five mills of 3 tons per hour capacity each, with one stand-by mill. Assumed cost £3,000 per mill, total cost £18,000.

Annual Charges

For depreciation, assuming a life of ten years for each type of equipment, the annual charge is taken for a rough comparison as one-tenth of each of the above costs. The cost of maintenance is taken as 1d. per ton for the low-speed, 2d. for the medium speed and 3d. for the high-speed mills. Assuming a load factor of 0·75 per cent (6,600 hours annual service) the total coal burned is 100,000 tons annually. Therefore the annual cost of maintenance is £400, £800 and £1,200 for the three types of mill.

The power consumed by the low-, medium- and high-speed mills respectively is taken as 24, 16 and 20 kWh per ton of coal ground. With electricity at ½d. per kWh, the annual charge for the first is £5,000, for the second £3,300 and for the third type £4,150.

The above charges add up to some £7,000 to £8,000 per annum, depending on the type of mill, which are relatively small compared with the cost of the coal, which at 50s. per ton amounts to £250,000 per annum. Any type of pulverizer that enables the fuel to be burned with a higher efficiency gives a saving which may very well outweigh any higher initial or running cost.

Efficiency and Fuel Cost

Regarding the gain in efficiency resulting from high and sustained fineness of pulverization, test results published in the U.S.A. show a drop of 5 to 10 per cent in efficiency in extreme cases of coarse grinding and of 1 to 2 per cent for even a moderate drop in fineness. The comparatively rapid wear of the high-speed mill may reasonably be expected to cause a definite reduction in average efficiency, compared with the less vulnerable low-speed mill. Putting the day-to-day loss in efficiency at 1 per cent for the medium-speed mill and 2 per cent for the high-speed, the annual fuel cost in the first case will be about £252,500 and in the second case £255,000.

The total annual fuel and operating costs in the three cases considered will now be as follows:—

	Low-speed	Medium-speed	High-speed
	£	£	£
Depreciation ..	3,000	2,400	1,800
Maintenance ..	400	800	1,200
Power	5,000	3,300	4,150
Coal	250,000	252,500	255,000
	258,400	259,000	262,150

Thus, in spite of its higher initial cost and power charges, the low-speed mill shows an annual saving of £600 over the medium-speed mill and £3,750 over the high-speed mill. This result is not in any way conclusive, nor does it show any decisive advantage of one type of mill over another, but the results will it is hoped, indicate what factors are important in any assessment of pulverizer performance.

Next Week's Events

Monday, 11th October

BIRMINGHAM.—Grand Hotel, 6 p.m. I.E.E. South Midland Centre. Chairman's address by Dr. W. G. Thompson, annual meeting and conversazione.

BRISTOL.—Grand Hotel, 5 p.m. I.E.E. Western Centre. Chairman's address by W. Hill.

LONDON.—Savoy Place, W.C.2, 7 p.m. I.E.E. London Students' Section. Chairman's address, "The Telephone Relay," by A. Mason.

MANCHESTER.—At the Manchester Geographical Society, 16, St. Mary's Parsonage, 7.30 p.m. Junior Institution of Engineers (North-Western Section). Annual general meeting followed by presidential address, "Fuel and the Future," by J. Grayston.

NEWCASTLE-ON-TYNE.—Neville Hall, Westgate Road, 6.15 p.m. I.E.E. North-Eastern Centre. Chairman's address by L. Mellor.

Tuesday, 12th October

BELFAST.—Queen's University, 6.45 p.m. I.E.E. Northern Ireland Centre. Chairman's address by J. E. Jones.

CAMBRIDGE.—Cambridgeshire Technical College, 6 p.m. I.E.E. Cambridge Radio Group. Chairman's address by D. H. Hughes.

GLASGOW.—Royal Technical College, George Street, 7 p.m. I.E.E. Scottish Centre. Chairman's address by J. Cogan.

LONDON.—Savoy Place, W.C.2, 5.30 p.m. I.E.E. Measurements Section. Chairman's address by Dr. S. Whitehead.

Royal Society of Arts, John Adam Street, W.C.2, 6 p.m. Illuminating Engineering Society. Presidential address by J. M. Waldram.

85, Minories, E.C.3, 5.30 p.m. Institute of Marine Engineers. "The Possibility of the Application of the Heat Pump for Air Conditioning on Board Ship," by F. Joder.

MANCHESTER. — Engineers' Club, Albert Square, 6.15 p.m. I.E.E. North-Western Utilization Group. "Factors governing Specifications for Flexible Electric Cables," by W. Bowen.

Wednesday, 13th October

ABERDEEN.—Caledonian Hotel, 7.30 p.m. I.E.E. North-East Scotland Sub-Centre. Chairman's address by A. Gardner.

BIRMINGHAM.—James Watt Memorial Institute, 6.45 p.m. I.E.E. South Midland Students' Section. "Communications over H.T. Networks," by W. P. Warren.

EDINBURGH.—Heriot-Watt College, 7 p.m. I.E.E. Scottish Centre. Chairman's address by J. Cogan.

FARNBOROUGH.—R.A.E. College, 6.30 p.m. I.E.E. Southern Centre. "Three-Dimensional Cathode-Ray-Tube Displays," by E. Parker and P. R. Wallis.

LONDON.—Savoy Place, W.C.2, 5.30 p.m. I.E.E. Radio Section. Chairman's address by F. Smith.

At the Institution of Mechanical Engineers, Storey's Gate, S.W.1, 6 p.m. Institution of Heating and Ventilating Engineers. Autumn general meeting.

I.E.E. London Students' Section, 2.30 p.m. Visit to Muirhead & Co., Ltd., Elmers End, Kent.

SHEFFIELD.—Royal Victoria Station Hotel, 6.15 p.m. I.E.E. Sheffield Sub-Centre. Chairman's address by W. W. Grimes.

Thursday, 14th October

BIRMINGHAM. — Midland Hotel. E.I.B.A. Birmingham Area Branch. Luncheon and general meeting.

DUNDEE.—Royal Hotel, Union Street, 7 p.m. I.E.E. North-East Scotland Sub-Centre. Chairman's address by A. Gardner.

LONDON.—Savoy Place, W.C.2, 5.30 p.m. I.E.E. Utilization Section. Chairman's address by R. O. Ackerley.

At the Institute of Marine Engineers, 85-88, The Minories, E.C.3, 6.30 p.m. Institute of Welding (South London Branch). Film meeting and chairman's address.

SWANSEA.—Guildhall, 6 p.m. I.E.E. West Wales (Swansea) Sub-Centre. Chairman's address by G. Rutter.

Friday, 15th October

STAFFORD.—King Edward Grammar School, 7 p.m. I.E.E. North Staffordshire Sub-Centre. Chairman's address by C. C. Pimble.

Saturday, 16th October

LEEDS.—Yorkshire Electricity Board Offices, Whitehall Road, 2.30 p.m. I.E.E. North Midland Students' Section. Film show.

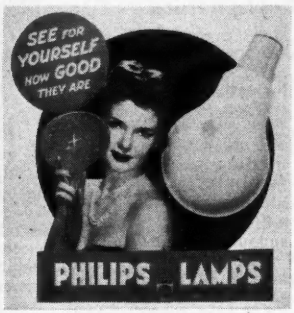
Meter Company's Jubilee

ON 25th August last Aron Electricity Meter, Ltd., celebrated its fiftieth anniversary, the company having been incorporated in 1898 to manufacture the clock and other meters invented by Prof. Dr. Hermann Aron, who was the first managing director. Many well-known names in the electrical industry have been associated with the company since its inception and the original board of directors included Sir James Pender, Bt., M.P., Col. R. E. B. Crompton and Lord Hirst. The late Mr. E. W. Hill, who served the company for forty-five years, was an acknowledged authority on meters and with Mr. G. F. Shotter was responsible for the design of the Hill-Shotter kVA meter. The members of the present board are: Mr. E. D. A. Herbert (chairman), Sir Patrick Ashley Cooper, Mr. A. N. Rye, Mr. M. Denne and Mr. L. Freeman (managing director).

Lamp Publicity

THE Metropolitan-Vickers Electrical Co. is again using its slogan " When daylight fades . . . Switch to Metrovick and Cosmos Lamps." This will be illustrated by attractive Press advertisements, showcards and window displays. This year a new scheme of medium-size window displays has been started for the retailer, and several attractive designs requiring a minimum of dressing are available. The displays average 5 ft overall height and open from 4 ft to 7 ft overall width such as the design illustrated. A new lamp catalogue is in preparation and for the first time for many years it returns to quarto size (11 in. by 8¼ in.), which provides a more concise layout with better illustrations for ready reference. The familiar orange covered priced folder on fluorescent lamps has been brought up to date, and has been redesigned for use as a pin-up counter reference, enabling the retailer to see at a glance the complete price plus purchase tax on all the standard ratings. Brochures and leaflets are available covering the whole of the range of fittings marketed by the company.

New Metrovick window display



Philips Lamps large window centrepiece

Background to the 1948-49 Philips Electrical lamp publicity campaign is a new poster, which with its paraphrased headline—" If eyes could only speak "—strikes a new note in lamp advertising. The treatment is mainly blue and yellow with orange lettering, and makes an arresting combination of idea and colour. It will appear mainly on the London Underground system in 16-sheet and 4-sheet sizes.

A large window centrepiece standing 3 ft 6 in. high is also available. It is in natural colour photography, in two planes, and is intended primarily for the larger sizes of dealers' windows.

For smaller premises another attractive showcard is available in reasonable quantities and is suitable for counter or window display. There are also counter leaflets for general distribution with overprinting space for the dealer's name. This takes the form of a quick reference price list of general lighting service lamps and discharge lamps and includes purchase tax where applicable. The 1948-49 Philips lamp catalogue will also be available from 8th October, listing the complete lamp range as well as much useful general information, and including purchase tax tables. In addition there is a selection of small showcards and a range of lighting fittings literature.

Domestic Electricity Tariffs

THE British Electricity Authority and the Area Electricity Boards have, at the request of the Minister of Fuel and Power, decided to put into effect the recommendation of the Clow Committee that certain electricity tariffs should be amended so that instead of a uniform " unit " charge throughout the year the charge for three months in the winter should be relatively higher and that for the other months of the year relatively lower. The object of this recommendation is to reduce the use of electricity at times of peak load during the winter months.

Accordingly it has been decided that the " unit " charge of domestic tariffs in force at the time shall be subject to a surcharge of 0·35d. during the winter period (coinciding as nearly as practicable with the three months, December, January and February). This surcharge will be discontinued at the end of that period and for the ensuing period of approximately nine months the consumer will receive the benefit of a rebate of 0·1d. per kwh. The surcharge and rebate will not apply to charges under lighting flat rate tariffs. The three-month period of surcharge will vary according to the meter reading arrangements in operation in the respective districts.

It is emphasized by the Authority that the purpose of the surcharge is solely to discourage the domestic demand at the critical peak-load periods and not to provide additional revenue, and it is estimated that, allowing for the rebate over the ensuing nine months of the year, the broad effect of the introduction of this differential tariff will be that, over the full year, the total receipts for electricity will not be materially affected. When the financial position resulting from the winter surcharge is known the question of still further reducing the " summer " charge will be carefully considered.

COMMERCE and INDUSTRY

First Census of Distribution. Designers' Place in Production.

THE Board of Trade has made an Order fixing 1950 as the year in which the first full Census of Distribution will be taken. The Order is made under the Statistics of Trade Act. The census, which will be compulsory, will be taken early in 1950 in respect of the year 1949 and will involve wholesalers, retailers and other services. A voluntary "pilot" census was taken earlier this year to provide working data for the full census. The Board of Trade is at present considering the forms to be used in the full census in consultation with the Advisory Committee which was appointed in the earlier part of this year.

Increase in Metal Prices

The Minister of Supply has made the Control of Non-Ferrous Metals (No. 32) (Copper, Lead and Zinc) Order, 1948, S.I. 2201 of 1948, which raises the maximum prices of copper, lead, zinc and zinc products with effect from 1st October. The new maximum prices per ton are:—Electrolytic copper £140 (increase of £8); good soft pig lead £112 (increase of £22); good ordinary brand zinc £92 (increase of £17); zinc sheets £104 (increase of £17); zinc oxide (white seal) £89 15s. (increase of £14 5s.)

The Minister also announces that as from 1st October, the price of virgin aluminium in ingot form has been increased from £80 to £87 per long ton delivered into consumers' works, with an addition of £2 10s. per ton for metal in notch bar form. The new price will apply to metal of a purity of 99-99·5 per cent inclusive, and the existing premiums for higher purities will be payable in addition.

Purchase Tax on Electric Blankets

The Commissioners of Customs and Excise have decided not to regard domestic electric blankets and warming pads as chargeable at the rate of 66⅔ per cent under Group 5 of the tax schedule (domestic soft furnishings and bedding). They will therefore be chargeable at the rate of 33⅓ per cent under Group 12 (*a*) of the Schedule (cooking, heating, refrigerating and other appliances for domestic purposes).

Electricity for Cotton Industry

The chairman (Sir Raymond Streat) and other representatives of the Cotton Board were received last week by Mr. H. Gaitskell, the Minister of Fuel and Power. The Parliamentary Secretary to the Ministry of Labour and National Service (Mr. Ness Edwards, M.P.) was present at the meeting.

The Cotton Board representatives emphasised the urgent need for the Government to take every step possible to improve the supply of electricity to industry and promised their full co-operation in efforts to avoid the need for load shedding. They drew attention, however, to the increasing difficulty in carrying out such measures. The Minister assured the deputation that all that could be done was being done to increase generating capacity and welcomed the assistance offered.

Steel Board Winding Up

On Friday last the Ministry of Supply announced the winding-up of the Iron and Steel Board. The chairman (Sir Archibald Forbes) and four of the six members whose appointments terminated on 1st October have expressed their unwillingness to continue for a further term in view of the circumstances likely to arise from the Government's proposal to nationalize sections of the iron and steel industry.

Historic Lamps for Nation

Historic electric lamps which have formed part of the "Darkness into Daylight" Exhibition at the Science Museum, South Kensington, are to be presented to the nation. They will be added to the permanent illumination exhibition of the Museum. The lamps, and other historic electric lighting apparatus, which are owned by a number of private persons or by electric lamp manufacturing companies were to be handed into the care of Dr. H. Shaw, Director of the Science Museum at a short ceremony yesterday (Thursday), following the closing of the Exhibition on 6th October.

Among the many valuable lamps to be handed over are some of the earliest examples of filament lamps, the first discharge tube made by Becquerel in 1867, and the first electric lamps to be fitted in lighthouses. The "Darkness into Daylight" Exhibition has been seen by over half a million people.

Power for Scottish Industries

Mr. Thomas Johnston, chairman of the North of Scotland Hydro-Electric Board, said last week that electro-chemical and electro-metallurgical industries in Scotland might find the Board's charges for power too high. In such cases they might be forced to seek Government subsidies; in fact two industries of national importance had already been advised to do so. Mr. Johnston said that increased construction costs had made it impossible for the Board to compete with prices at which power for such large-scale consumers could be obtained in other countries. He rejected any suggestion that the Board should offer electricity to these industries at cost price or less as this would defeat the statutory object of the Board, which

was to meet the needs of the Highland population by supplying them with electricity at a reasonable price. To do this would not be possible unless profits could be earned from the sale of bulk supplies to the grid and elsewhere. He did not think it right for the crofters, farmers or the inhabitants of Dundee and Aberdeen to subsidize these industries.

" Design at Work "

The first exhibition of the work of Royal Designers for Industry will be opened by the Duchess of Kent at the Royal Academy on 26th October. The exhibition, which is being sponsored by the Royal Society of Arts and the Council of Industrial Design, will be opened to the public from 27th October to 28th November. The exhibition will demonstrate the place of designer's in modern machine production and marketing methods. In a series of " case-histories " the work of the designer is studied in a number of subjects ranging from the production of a new radio set to the making of a wine glass, and from the shaping of an electric light fitting to the weaving of a utility fabric. By means of actual objects, photographs and dioramas, the public will see the various stages in the creation of a number of well known products and of some new designs that have not been shown before. They will see the designer in active relationship with other members of the production team.

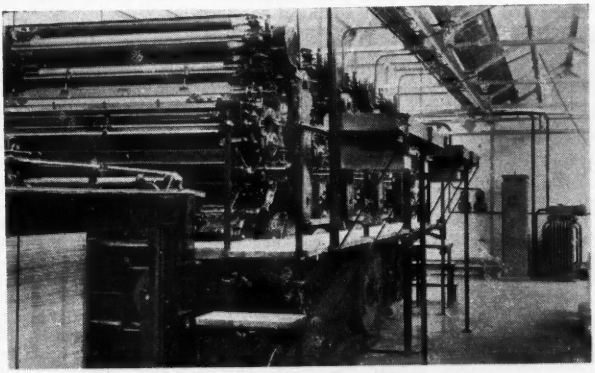
Batti-Wallahs' Society

After a lapse during the holiday period, the Batti-Wallahs' Society resumed its monthly luncheons last week, when the chief guest was Mr. W. J. Jones, director of the Electric Lamp Manufacturers' Association, who gave an interesting talk on " A Century of Electric Lighting." Mr. Jones referred to the great public interest in the " Darkness into Daylight " Exhibition at the Science Museum, Kensington, which comes to an end this week. He briefly outlined the various stages of development from the carbon filament lamp produced by Swan in 1878, from which hundreds of types of modern lamps have been developed, to the modern electric discharge, fluorescent and high-brightness lighting of the present day. While acknowledging the pioneer work of such great men as Faraday and Swan he paid tribute to the work of the research teams in the modern laboratories who had recaptured the leadership for this country in lighting research.

Large Sheet Colour Press

What is claimed to be the largest sheet colour press in Europe was put into service last month by Jarrold & Sons, Ltd., of Norwich. It is a four-colour offset press which takes a sheet 50 by 69 in. and can run at 4,500 sheets per hour. The total weight is 60 tons.

The main driving motor is a variable speed " N-S " motor by Laurence, Scott & Electro-



Large sheet colour press at the works of Jarrold & Sons, Ltd., showing the main driving motor and " predictor regulator "

motors, Ltd., rated at 40/10·1 h.p., 1,800/630 r.p.m., 400 V, three-phase, 50 cycles. The " N-S " motor is a stator-fed, fixed brushgear machine, the speed being controlled by an induction regulator. In this instance the remote control of speed includes an L.S.E. " predictor regulator " by means of which the desired speed can be set before starting, and the motor then runs up to this speed without further attention from the machine minder after the " start " button has been pressed. The speed can also be adjusted while running, if desired. Speed adjustment is continuous, without steps, between the top and bottom limits.

The range of " N-S " motors has recently been extended to include standardized small machines down to about 1 h.p. In the other direction, two 1,130/100-h.p. totally enclosed machines, 1,150/500 r.p.m., have just been completed.

" Telcon " Magazine

We have received the first number of the " Telcon " house magazine produced by the Telegraph Construction & Maintenance Co., Ltd. It is prefaced by a message from the chairman, Sir Geoffrey Clarke. The contents include many personal and sports items, an article on

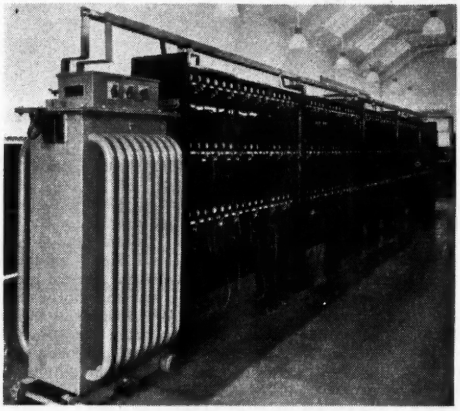
the Anglo-Dutch telephone cable by Mr. J. N. Dean, B.SC., another on developments in the copper drawing section by Mr. C. M. Roberts, and notes on various works matters. Colour is tastefully employed in this handsome production.

Metallurgical Information

A comprehensive collection of information, which will be of some interest to metallurgists in the electrical industry, is given in a 394-page volume published by the Climax Molybdenum Co., of New York. It commences with an outline of the technical effects of molybdenum followed by an explanation of its fundamental effects and the methods of adding it to other metals. Various types of steel are then treated, followed by cast iron and in conclusion non-ferrous alloys for special purposes. Throughout the book there are extensive references to other publications and in addition there is a useful appendix.

Metal Rectifiers

We regret that in the earlier copies of our last issue an incorrect caption appeared under the picture on page 504. It should have read:—"Early copper oxide rectifier equipment for charging miners' lamp batteries." The oil-immersed constant potential 500-A charger for Oldham miners' cap-lamps is depicted in the accompanying illustration.



Constant potential 500-A oil-immersed charger for a miners' cap lamp installation

Bull Motors Sales Conference

Prototypes of projected machines for the industrial, "super-silent" and f.h.p. motor fields were demonstrated to representatives from all branch offices when they attended the Bull Motors (E. R. & F. Turner, Ltd.) golden jubilee sales conference at Ipswich on 21st and 22nd September last. Lectures by the technical design staff also formed part of the programme. A number of the new developments described will be introduced in 1949, and preliminary investigation of users' requirements will be made by area representatives during the latter part of this year.

At a dinner held at Felixstowe on 21st September, the chairman and managing director, Mr. A. Leggett, received the good wishes of the conference on his departure for a tour of the company's overseas agents. Mr. Leggett will visit South Africa, Australia, New Zealand, Canada and America.

B.S. for Kitchen Equipment

The 1944 edition of B.S. 1195, "Kitchen fitments and equipment" recommended a series of overall dimensions for various kitchen appliances and storage units. It also included general requirements, with drawings, for storage units fitted with shelves or drawers or equipped as broom cupboards and arranged in positions to suit available kitchen space and requirements of individual users. A new edition includes a simple system of reference numbers for the units and a new section which gives detailed constructional requirements for units of timber framing covered with plywood or hardboard together with recommendations for the types of hardware to be used. Requirements for work tops in a wide range of materials are also given.

A further section dealing with the construction of storage units in metal is in course of preparation. Copies of B.S. 1195-1948 may be obtained from the British Standards Institution, 24, Victoria Street, London, S.W.1, at 4s., post free.

E.R.P. Imports

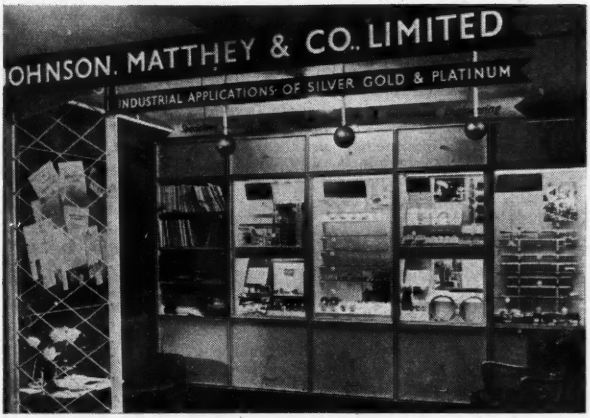
A number of inquiries have been received from importers as to the possibility of obtaining goods from the United States under the European Recovery Programme and the procedure that should be followed to obtain such imports. The Board of Trade states that it is not proposed to alter the existing channels of procurement of imports and accordingly applications for necessary import licences should still be made to the Import Licensing Department, 189, Regent Street, London, W.1. Where it is decided that it is appropriate to obtain an item on E.R.P. terms, the importer will be so informed and will be notified of any additional formalities required. These will relate in the main to the production of evidence of shipment, of a certificate from the overseas supplier and of payment to the overseas supplier so as to satisfy the U.S. authorities that the funds made available by

them have been used in the manner intended; certain stipulations regarding the marking of shipments to identify them as E.R.P. cargoes may also be necessary. Applications and inquiries should not be sent to the office of the Economic Co-operation Administration in the United Kingdom, which is in no sense a procurement agency.

Instruments at Copenhagen

The Scientific Instrument Manufacturers' Association, whose members include many well-known electrical manufacturers, has sent us a copy of the brochure produced in connection with the Association's display at the Copenhagen Exhibition. This handsome handbook contains adequate details of the various exhibits, covering an extremely wide range, and is well illustrated. It contains a list of exhibitors' agents.

We illustrate the display arranged by Johnson, Matthey & Co., Ltd., which included examples of the industrial applications of silver, gold and the platinum metals as well as a range of the company's base metal products. The electrical uses of silver and beryllium-copper were exemplified on the stand.



Johnson, Matthey stand at Copenhagen

Among the exhibits in the scientific instrument section were high-vacuum pumps, vacuum measuring instruments and special vacuum plants by W. Edwards & Co. (London), Ltd.

"Creda" Cooker Production

The design and manufacturing story of "Creda EV" electric cookers is told in an excellently produced publication entitled "Inside Information" sent us by the Simplex Electric Co., Ltd. A special feature is the use of eight sectional views in transparencies to show the construction of the cooker. Pictures are also included of the company's extensive new works at Blythe Bridge. The book has been produced primarily for export and for B.E.A. engineers and the edition is strictly limited. It has been distributed to the company's main customers.

Trade with Germany

The Export Promotion Department of the Board of Trade has circulated in its Special Register Service of Information a résumé of a report by the Joint Export-Import Agency on the procedure to be followed in connection with imports and exports between this country and Germany. It covers such matters as the procurement of goods, licences, shipping documents, exchange arrangements and methods of payment.

Engineering Wages Agreement

At a meeting of representatives of the Engineering and Allied Employers' Federation and the Confederation of Shipbuilding and Engineering Unions on 30th September it was agreed that the 5s. a week increase in the national bonus should take effect from the beginning of the first full pay period after 4th October. This will also apply to the proportionate increases in the wages of boys and youths and to the levelling up of basic minimum rates in districts where they are below 66s. per week for skilled and 51s. for unskilled men. Recognized differentials between the pay of skilled workers and that of skilled fitters which operate in certain cases are to be continued.

A joint sub-committee has been set up for the purpose of examining the wages structure of the industry, with particular reference to the consolidation of the present national bonus with the basic rates.

International Glass Convention

The International Commission on Glass and the Society of Glass Technology held joint meetings at Sheffield and Buxton from 30th September to 2nd October which were attended by 130 scientists and glass technologists from Belgium, Czechoslovakia, Denmark, France, Holland, Norway, Sweden, the United States and Great Britain. Previous international conventions were held in Italy (1933) and in

Great Britain (1936). Apart from discussing fifteen contributions dealing with the atomic structure and surface chemistry of glass, the delegates had the duty of arranging future international conventions.

Electricity Output

The output from solid-fuel fired generating stations in the week ended 24th September was 782·5 million kWh, as compared with 751·6 million kWh in the preceding week and 700·9 million in the week ended 26th September, 1947. Stocks of coal at power stations at 25th September amounted to 4,295,100 tons.

Contract Price Adjustment Formulæ

Following upon the increase in engineering wages the British Electrical and Allied Manufacturers' Association has issued revised figures for its contract price adjustment formulae. The rate of pay for adult male labour (4th October) is 115s. (5s. increase). The Board of Trade index figure for intermediate products for the month of August (249·6) is still the latest available.

Electrical Naval Officers

A limited number of commissions in the Electrical Branch of the Royal Navy are offered to university graduates by the Admiralty. Candidates, who must be between the ages of twenty-one and twenty-five, are expected to have completed satisfactorily a three-year course in electrical engineering and have reached honours degree standard. Applications should be sent to the Secretary of the Admiralty (C.W. Branch), Whitehall, London, S.W.1.

Jerusalem "Espionage" Trial

One of the two employees of the Jerusalem Electric & Public Service Corporation who were charged with espionage by the Israel authorities, Mr. W. Hawkins, was found not guilty at a Jerusalem district court last week. Judgment in the case of the other employee, Mr. F. Sylvester, was postponed for a week. The judge held that insufficient evidence had been presented to warrant proceeding with the charges against Mr. Hawkins.

Siamese Purchasing Mission

It is expected that the Siamese Government will accept an invitation of the British Government to send a purchasing mission to Britain. It is understood that Siamese industrial equipment requirements include signalling equipment, electrical goods, including generators, motors and transformers, radio transmitters, telecommunication equipment and welding plant.

Trade Announcements

It is announced that American spares for the series 71 General Motors 2, 3, 4 and 6 cylinder diesel engines and associated generators are now available from **Mackay Industrial Equipment, Ltd.**, Faggs Road, Feltham, Middlesex. The company has recently put into operation a service exchange system for blowers; water, oil and fuel pumps; injectors; generators and starters. It also has the facility to overhaul and bench-test these engines and undertakes light repairs on site.

Two more representatives have been engaged by **Standard Telephones & Cables, Ltd.** (Industrial Supplies Division). Mr. L. T. Wills will cover territory comprising Hampshire and Dorset and will operate from 41, Westridge Road, Southampton. Mr. S. S. Davidson, working from West End Cottage, Whittlesford, Cambridge, will represent the company in Cambridgeshire, Huntingdonshire, Norfolk and Suffolk. Both will deal with inquiries for private telephone and fire alarm systems, staff locating systems, r.f. heating equipment, etc.

Cantie Switches, Ltd., has removed to Port Causeway, New Ferry, Birkenhead, Ches. (telephone: Bromborough 1227).

Changes of Address

Control Components, Ltd., are now at 15, Goodge Place, London, W.1 (telephone: Museum 9941).

Arcolectric (Switches), Ltd., are now at Central Avenue, West Molesey, Surrey.

Trade Publications

Siemens Electric Lamps & Supplies, Ltd., 38, Upper Thames Street, London, E.C.4.—Priced leaflet (Z.167) illustrating earth leakage circuit-breaker fitted with overload protection.

Sturtevant Engineering Co., Ltd., Southern House, Cannon Street, London, E.C.4.—Technical brochure No. 9902 on fertilizer mixing units and dressing plants.

Woden Transformer Co., Ltd., Moxley Road, Bilston, Staffs.—Priced catalogue of radio transformers, chokes and public address equipment.

Everett Edgcumbe & Co., Ltd., Colindale Works, Hendon, London, N.W.9.—Priced leaflets giving technical details of a phase sequence indicator; and the "Vampire" universal test set and the "Hum Metrohm" insulation and conductivity tester.

Harbrix Industries, Ltd., Nelson Place, Rock Ferry, Birkenhead.—Priced folder dealing with an instantaneous electric water heater.

Aidas Electric, Ltd., Sadia Works, Rowdell Road, Northolt, Greenford, Middlesex.—Two illustrated folders and price lists on "Sadia" electric and coal-electric water heaters.

Metropolitan-Vickers Electrical Co., Ltd., Kingsway, London, W.C.2.—Folder describing the S.O. 50 totally-enclosed "Perspex" street lighting lantern.

British National Electrics, Ltd., Newarthill, Motherwell, Scotland.—Priced leaflet on a reflector type trivet.

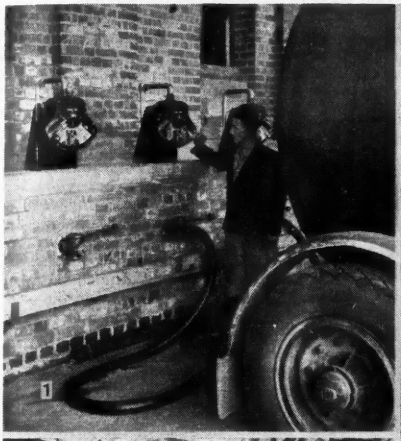
Bull Motors (E.R. & F. Turner, Ltd.), Ipswich.—Priced catalogue of industrial a.c. motors, accessories, spares and control gear.

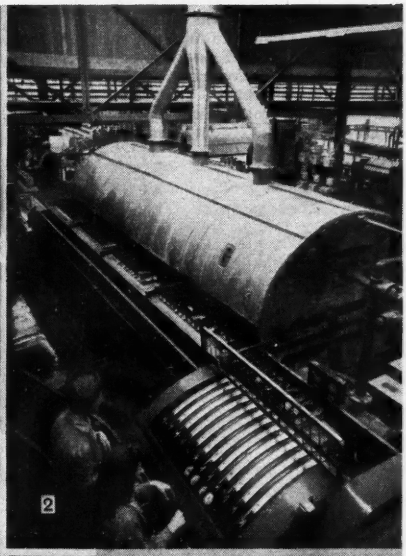
Bottling Beer

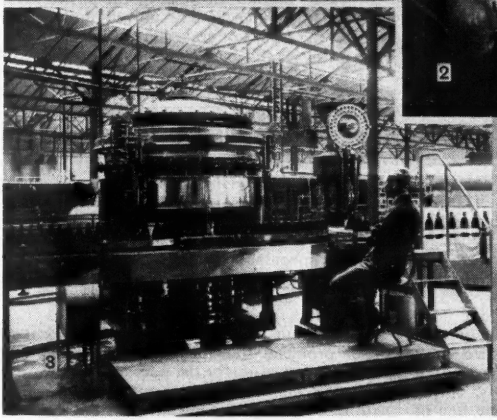
COMPLETELY MECHANIZED PLANT AT BURTON-ON-TRENT

THOROUGH mechanization, almost fully automatic, renders a new bottling stores just opened at Burton-on-Trent by Ind Coope & Allsopp, Ltd., almost certainly the most up-to-date installation of its kind in the world. The plant will have a capacity of over a million bottles a day and in only one process do the bottles have to be touched by hand. So highly organized in fact is the plant that a central control room, with a wall panel rather similar to that of an electric totalisator, has been provided. From here, with the aid of counting devices designed and made by Harding Rhodes & Co., Ltd., it is possible to control operations throughout the stores, at the same time getting at a glance a complete picture of the progress of particular processes, stocks, etc. Besides keeping this close check on stocks, the installation has the further advantage of recording the numbers of bottles at each stage in production so that breakages, so costly to-day with the high beer duty, can be kept as few as possible.

One of the biggest difficulties to be overcome has been that there are fifteen distinct varieties of drink to be handled, including Guinness and cider. All these liquids at present arrive at the bottling stores by road or rail, mainly in glass-lined steel tankers, but soon a pipe-line will enable





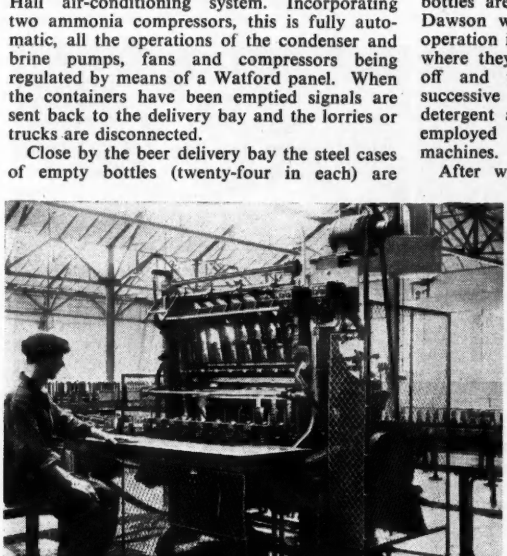


1.—Beer for bottling being delivered from the Brewery. Notice the adaptation of the marine telegraph system indicating quality of beer delivered. 2.—A washing machine which washes and rinses the empty bottles. 3.—Filling and crown corking machine

beer from the company's brewery half a mile away to be pumped over.

Traffic signals control the lorries entering the works, and on arrival at the receiving bays, the tankers are connected up to pipes leading to the cold room and signals are sent by means of the Chadburn marine telegraph system indicating on an illuminated panel the type of beer, etc., being delivered. The beer is then drawn off into one of the seventeen 120-barrel storage tanks in the cold room, the temperature of which is maintained at 34 deg F by a J. & E. Hall air-conditioning system. Incorporating two ammonia compressors, this is fully automatic, all the operations of the condenser and brine pumps, fans and compressors being regulated by means of a Watford panel. When the containers have been emptied signals are sent back to the delivery bay and the lorries or trucks are disconnected.

Close by the beer delivery bay the steel cases of empty bottles (twenty-four in each) are



4.—High-speed labelling machine

unloaded on to conveyors where they are electrically counted by means of Harding Rhodes & Co., Ltd. equipment incorporating B.T.H. "electric eyes." The crates, which are of different sizes according to whether they contain 1-pint, ½-pint or "nip" bottles, are then automatically sorted by means of a system of deflectors over the conveyors which guide them on to one or other of the three main lines of conveyors. An ingenious device called "an automatic policeman" ensures the even flow of crates from two converging conveyors, spring arms near the junction holding up one line of crates while there are crates travelling along the other.

With the aid of an elaborate Westinghouse control system, an operator can feed the crates, by means of points, on to whichever of the ten bottling line conveyors desired. Five of these bottling lines deal with ½-pint bottles, two each with pints and nips, and one with cider or Guinness. Special conveyors deal with partly full crates, feed in extra crates from store during rush periods of the year (before Christmas, Bank Holidays, etc.) and return the surplus to store in the periods which follow. The conveyor system, which is driven by a series of 2-5-h.p. motors, was supplied by W. & C. Pantin, Ltd.

The ten bottling lines are each laid out to deal with 600 dozen bottles an hour. The bottles are fed by hand into the Gimson or Dawson washing machines (the only manual operation in the whole of the bottling process) where they first have their old labels washed off and then pass on conveyors through successive washes of hot, very hot and cool detergent and water. Motors of 17 h.p. are employed to operate the pumps of these machines.

After washing, the bottles are carried on stainless-steel conveyors (with ¾-h.p. vertical-spindle motors) to the filling machines where the beer, arriving from the cold room along an air-conditioned duct, is automatically fed into the bottles. Chadburn telegraph panels connected with the control room are situated both by the filling machines and in the cold room. The bottles are then carried along further conveyors to the crowning machines and to the pasteurizers, where they are kept at a temperature of 140 deg F for an hour to arrest any further fermentation. In most of the pasteurizers the bottles are moved through by means of cross-bars at intervals, but as this has the disadvantage of tending to knock the smaller bottles over on to their sides, in the latest machine just developed a conveyor is incorporated. Leaving the pasteurizers the bottles are automatically labelled. Like the filler and crowners, the labelling machines are driven by 1- or 1½-h.p. motors and are operated by means of compressed air supplied by three Broom & Wade compressors driven by 50-h.p. motors.

Throughout the bottling process timing is a major problem. To facilitate this and also to obtain an indication of the number of breakages occurring, photo-electric counting machines, with repeaters in the control room, are fitted on to the bottle conveyors at both entry and exit of each machine. Incidentally the broken bottles are carried away by means of a Ransome electric vehicle, a "Westalite" charger being provided.

The bottling completed, the bottles are

automatically packed two dozen at a time, the crates (according to their contents) being guided into the appropriate conveyor to the full stores. Here an installation is just being completed whereby an operator sitting at a desk will be able, by means of a dial very similar to that of an automatic telephone, to send on conveyors to the loading bay the requirements for each particular order, with the crates in the correct order for loading. No manual operation whatever will be necessary, the only requirement being that the feeding conveyors should be kept filled.

Altogether throughout the works there are at present 220 electric motors (almost all Crompton Parkinson) installed, representing 927 h.p. Eventually another 100 motors will be installed, adding a further 330 h.p. Fluorescent lighting is employed extensively and is particularly effective in the cold room and the bottling hall. In the case of the bottling hall rows of twenty-seven B.T.H. 5-ft units have been installed.

The electricity supply is received from the East Midlands Electricity Board at 3,000 V and is converted to 400/230 V by means of two 750-kVA Brush transformers, whence it is taken to the main distribution board. The Ellison switchgear used, painted in orange, provides an attractive contrast to the general duck-egg blue decoration of the switchroom. A bus-coupler enables supplies from the transformers to be used separately or in parallel. The lighting, heating, etc., are split over the three phases. Provision is made for the installation of an emergency generating plant if it should be considered necessary. The whole of the distribution is by means of armoured cable taken underground, the main and sub-distribution boards being of English Electric construction. The complete electrical installation was carried out by Ind Coope & Allsopp's own electrical department.

Correspondence

Letters should bear the writers' names and addresses, not necessarily for publication. Responsibility cannot be accepted for the opinions expressed by correspondents.

Portable Electric Tools

I WAS interested in Mr. Bennett's remarks under the above heading. Wholesalers, factors and ironmongers are useful people but their services are sometimes over-rated. Recently we required some "special" elements and forwarded our official order with sketch to a well-known manufacturer. We were surprised to get our order and sketch returned, with the request that these should be sent to a certain wholesaler. This we did but the reply we received was exactly what we anticipated, namely, "We cannot do this." We again returned our sketch and order to the manufacturers, who sent us the elements in due course and we have now received the wholesaler's invoice.

Surely, in such circumstances, that procedure is a gross waste of time apart altogether from the fact that the wholesaler has done nothing in connection with the order, except to send us an invoice.

Glasgow. ALEX. MILNE, *Senr.*

Electrical Accidents

WITH reference to Mr. A. Milne's letter on unsatisfactory installations, I am in complete agreement with his suggestion for periodical inspection of installations and suggest the inspection of consumers' apparatus at the same time.

I am amazed at the shoddy and dangerous methods consumers use in connecting apparatus bought over the counter to their installations. This is especially evident with electric irons; electric light pendants are too often used for this purpose.

I find that a large proportion of blown fuses on consumers' premises are caused by the short-circuiting of the flex just above the lampholder in rooms where electric irons are used. This is apart from the fact that under these conditions the iron is never earthed.

Chesterfield. C. COE.

Emergency Reserve Schemes

THE Ministry of Labour and National Service announces that the object of the Emergency Reserve Schemes is to entrol volunteers with valuable service experience who would be urgently needed for operational duties in the very early stages of any emergency. It is accordingly not proposed to restrict the acceptance of volunteers for these reserves except for persons engaged in a very limited range of employments which would also be of exceptional importance in the early stages of an emergency. Employment from which for the time being volunteers will not be accepted includes the following:—Railway service (operating and maintenance grades only, including workshop grades in shops and running sheds of the operating, signal and telegraph, mechanical, electrical and civil engineering departments); gas, water and electricity supply; students for a degree or equivalent qualification in science, engineering and mining.

Professionally qualified scientists and engineers are among those who will be accepted only provisionally.

FINANCIAL SECTION

Company News
Stock Exchange Activities

Reports and Dividends

The Palestine Electric Corporation, Ltd., held its annual meeting on 30th September. In a statement issued with the report and accounts, Viscount Samuel (chairman), says that despite disturbed conditions in Palestine during the year under review, the corporation's services proceeded uninterruptedly, the power stations worked to full capacity, and the business continued to grow. New consumers connected numbered 16,846, making a total of 124,320, and the sales of electricity increased by 20·7 per cent to a total of over 281 million kWh. The capital expenditure during the year was £P.961,665, chiefly on extensions of the Reading and Haifa power houses. The transmission and distribution systems have been extended by 268 km, making the total length of high-voltage transmission lines 1,601 km and of low-voltage distribution lines 1,473 km. To meet the heavy capital outlay on new plant and equipment, the directors intend to proceed (subject to the consent of the Capital Issues Committee) with an issue of capital to provide for the immediate financial requirements as soon as circumstances permit. The Jordan hydro-electric works situated in Transjordan territory was occupied by Arab troops in May this year and the corporation's personnel employed there were interned. Consequently the Jordan power house has since been out of commission. The Reading power station has suffered some damage from air action, which has, however, been quickly repaired.

Ultra Electric (Holdings), Ltd.—In his address which was circulated with the report and accounts for the year ended 31st March last, Mr. E. E. Rosen (chairman) says that successive increases in purchase tax have adversely affected the radio industry, and although the tax was reduced in mid-June 1948, much damage has been done which may take a long time to repair. The company has continued to expand its activities outside the field of domestic broadcasting. A large number of schools will shortly be equipped with public address systems, the company is continuing to supply communication control equipment for British aircraft, and has undertaken important work for Government Departments.

George Cohen, Sons & Co., Ltd.—In the course of his speech at the annual meeting held on 29th September, Mr. C. M. Cohen (chairman and managing director), said that in order to proceed with schemes of development already approved, and to continue to finance their high level of activity, it would be necessary to raise further finance of a permanent nature. They had therefore requested permission from the Capital Issues Committee to issue the remaining 500,000 4½ per cent cumulative preference shares authorised, and, subject to this being forthcoming, they would proceed in the near future provided that market conditions then permitted. Arrangements were being made for the issue to be underwritten and it was their present intention to confine the offer of shares to existing stockholders of both classes. The parent company's general business in plant, machinery and industrial equipment continued to be very brisk, and all their shops engaged on reconditioning and rebuilding were working to capacity. A large proportion of the machinery sold was destined either to be put into production by concerns who manufactured for export, or for export by themselves.

The Electric Furnace Co., Ltd., reports a consolidated profit on trading for the year ended 31st March last of £51,473, and after adding investment income of £3,566, provisions freed, £13,854, and deducting £12,909 for taxation and £1,589 patent fees, there is a balance of £57,573. After providing for directors' fees, interest, depreciation, etc., there is a profit of £25,809. The final ordinary dividend is 4½ per cent., making 8 per cent for the year, and £13,325 is carried forward.

Electrical Components, Ltd., reports a profit for the year ended 30th June last of £90,029, as compared with £85,506 for the previous year. Taxation requires £49,750 and reserves receive £8,000. It is proposed to pay a final dividend of 12½ per cent actual, less tax, making 20 per cent for the year (unchanged). The balance carried forward is £26,650 (against £17,412 brought in).

W. T. Henley's Telegraph Works Co., Ltd., has declared an unchanged interim dividend of 5 per cent.

The General Gas & Electricity Co., Ltd., reports a net profit for the year ended 31st March last of £26,741, as compared with £21,413 for 1946-47. The final dividend is 15 per cent, making 25 per cent for the year (same).

The Electrolytic Zinc Co. of Australasia has announced a dividend of 9 per cent on the preference and ordinary shares, making 15 per cent for the year (against 17½ per cent including a bonus of 2½ per cent).

The Ebonite Container Co., Ltd., has announced a final dividend of 14 per cent, making 19 per cent less tax, for 13 months (against 17½ per cent for the previous year), and also an interim dividend of 5 per cent for the current year (unchanged).

Peter Brotherhood, Ltd.—After charging £99,325 for taxation the net profit for the year ended 31st March last was £75,517, compared with £28,950 after tax for 1946-47. Distribution on the ordinary shares is maintained at 20 per cent.

The North of Scotland Hydro-Electric Board has made a further issue of stock guaranteed by the Treasury for the purpose of repaying temporary advances from the Scottish banks, for defraying further expenditure on constructional and distribution schemes and for other authorized purposes. The stock, to an amount of £6 million, was issued on 1st October to the National Debt Commissioners at the price of £101 per £100 of stock and until 1st December, 1948, will be known as North of Scotland Electricity 3 per cent Guaranteed Stock 1968-70, "A." After that date the stock will be amalgamated with the existing £6 million of North of Scotland Electricity 3 per cent Guaranteed Directors: A. W. Hughes and F. Naylor. Regd. Stock 1968-70, which was issued to the National Debt Commissioners at par on 1st July last. This issue has increased the outstanding capital of the Board to £17 million.

Crossley Bros. & Co., Ltd., report a combined net profit for the year ended 30th April last of £137,036, as compared with £61,478 for the preceding year. General reserve receives £23,000, tax allowances equalization reserve £15,000, and staff pension reserve £1,000. The deferred ordinary dividend for the year is 12½ per cent (same), and £115,080 is carried forward (against £63,751 brought in).

Aeronautical & General Instruments, Ltd.—With a final ordinary dividend of 5 per cent (against 9 per cent last year) the total for the year ended 31st March last is 8 per cent (against 16 per cent). Consolidated net profits amounted to £40,075, of which £7,492 is charged to tax and £15,100 reserved for future tax. The net profit of the parent company was £32,315 compared with £35,929 for 1946-47, before providing £18,712 (£28,500) for tax.

Morphy-Richards, Ltd., report a decline in net profits, before tax, from £119,628 for 1946-47 to £80,205 for the year ended 30th June last. The ordinary dividend for the year is unchanged at 160 per cent.

Stothert & Pitt, Ltd., are paying an ordinary dividend of 10 per cent and a bonus of 5 per cent, less tax, for the year ended 30th June last (unchanged).

New Companies

Cable Makers Properties, Ltd.—Registered 30th September. Capital, £100. To acquire, hold, manage and deal in real and personal property, licences, rights, etc.; to do all such things as may appear to be to the advantage of any persons or companies engaged in the manufacture or sale of electric cables, wires or flexible cords or other apparatus or effects used in the production, distribution or use of electrical energy; to promote the interests of the electrical industry, etc. Directors: Sir John C. Dalton (director of the Cable Makers' Association) and E. H. Wale (secretary of the Cable Makers' Association). Secretary: E. H. Wale. Regd. office: High Holborn House, 52-54, High Holborn, W.C.1.

Accumulator Patent Holdings, Ltd.—Registered 23rd September. Capital, £3,000. To acquire the rights in certain countries of the Dry Accumulator Co., Ltd. and Edmund W. Sudlow and Leonard Fuller in certain inventions relating to electrical accumulators; and to carry on the business of manufacturers of, dealers in, and repairers of, electrical accumulators, batteries, acids and containers, etc. Directors: E. W. Sudlow and Dr. H. C. Fuller. Solicitors: Gouldens, 16, Byward Street, E.C.3.

Companies to be Struck Off Register

The names of the following companies will be struck off the Register at the expiration of three months from the dates stated, unless cause is shown to the contrary:—21st September: Loan-A-Radio (London), Ltd.; Meter Wireless, Ltd.; Strawn Electric, Ltd. 28th September: Corona Electric Co., Ltd.; Electrical Services (Northwood), Ltd.; Electric Converter Furnaces, Ltd.; Electrode Holder Manufacturing Co., Ltd.; Hewelectric Co., Ltd.; Loan-A-Radio Holdings, Ltd.; Supreme Electrical Cutting Machine Co., Ltd.

Bankruptcies

E. N. Belsten, residing and carrying on business at 245, Highter's Heath Lane, Warstock, Birmingham, electrical contractor.—First and final dividend of 20s. in the £ and 4 per cent statutory interest, payable 19th October at the Official Receiver's office, Somerset House, 37, Temple Street, Birmingham, 2.

J. W. Gatenby, electrician, 7, High Street, Haverfordwest.—First meeting held 1st October. Public examination 29th October at the Shire Hall, Haverfordwest.

F. W. Bedingfield, carrying on business at 49, High Street, Folkestone, radio and electrical engineer.—First and final dividend of 2s. in the £ payable 8th October, at the Official Receiver's Office, 1, The Parade, Canterbury.

A. Fielding, residing and carrying on business at 223, Whalley New Road, Blackburn, electrician.—Last day for receiving proofs for dividend 12th October. Trustee, Mr. F. C. Ormrod, 20, Byrom Street, Manchester, Official Receiver.

Liquidations

Midland Radio Distributors, Ltd.—Winding up voluntarily. Liquidator, Mr. C. W. Thompson, 11, Waterloo Street, Birmingham.

Gregg Radio, Ltd.—Winding up voluntarily. Liquidator, Mr. J. E. Osborne, Midland Bank Chambers, Lowgate, Hull.

C. & D. Electric (Appliances), Ltd.—In voluntary liquidation. Liquidator, Mr. A. T. Eaves, 47, Mosley Street, Manchester.

STOCKS and SHARES

WHILE it can hardly be said that the international clouds show any marked inclination to lift, the fact remains that Stock Exchange prices hold their ground with firmness. This is particularly the case with gilt-edged stocks. British Government securities, including Transport and Electricity issues, make steady upward progress under the influence of widely-spread and substantial buying. Two of the most active stocks outside the gilt-edged list are British Electric Traction deferred and Thomas Tilling, around both of which there revolves a circle of lively interest. Industrial shares as a whole keep good, and business in most markets, although it comes spasmodically, is far from dormant. New issues secure a fair amount of support: in the next few weeks a considerable number of newcomers are expected to appear.

One popular explanation which is given to account for the strength of Electricity and Transport three per cent stocks and other British Government issues, is that large amounts of "funk funds" have found their way into the securities, some of the money coming from the Continent, some from big institutional buyers nearer home. The fact of the matter is that whenever the political outlook, foreign or domestic, is gravely unsettled, investment is disposed to brush aside the attractions of stocks save those of the highest character.

G.E.C. Ex Dividend

General Electric £1 ordinary are quoted at 85s. ex the full year's dividend deduction. This represents an advance of 1s. on the cum dividend price of 85s. 9d. a week ago. Satisfaction with the impressive full accounts for the year ended last March has not been upset by reference in the report to further financial requirements. The yield on the shares works out four guineas per cent from what is shown by the figures to be a conservative distribution. Apart from the financial results, points in the report to attract attention were the production and export achievements, and the exchange, since the date of the balance sheet, of the electricity supply interests, with a book value of little over £1 million, for £3,700,000 British Electricity stock.

Capital Requirements

The G.E.C. indicates in its report that, in increasing its business and production capacity, the bankers have provided the necessary finance. Bank loans appear in the balance sheet at over £4¾ million, and although this figure has since been largely reduced, further finance will be required. Markets are apt to show nervousness just now at the sight of a capital issue, but Crompton Parkinson, I.C.I. and others have lately demonstrated that investment still accepts with alacrity the opportunity to support a first-class issue with a bonus element about it. Imperial Chemicals new shares, for example, are 5s. higher than the price at which they were issued last month.

Company News

The Electrical Components company, which has just produced good figures for 1947-48, raised fresh capital a year ago by the issue of new ordinary shares at 12s., which is about the present price. These rank for the final dividend of 12½ per cent just declared on the present £170,830 capital, all in ordinary shares. The total distribution of 20 per cent is the same as last year's, and gives the shares a yield of 8½ per cent. Ultra Electric's chairman had the unusual task, at last week's meeting, of answering a shareholder who doubted whether any dividend should have been declared. Mr. Rosen told him that the company had its bankers' support in deciding that shareholders were entitled to their modest 5 per cent reward. The present price of the shares is 5s.

Week's Price Changes

Thomas Tilling, with a rise to £6 per share, are 3s. 9d. higher, and British Electric Traction deferred at 1965 shows a further gain of 40, after its rise of 325 points during September. Cable & Wireless stocks are better, the ordinary being 204, the preference 126½. Anglo-American deferred hardened to 22½. Decca and E.M.I. at 18s. 6d. and 19s. respectively, are 1s. higher on the week. Vactric gained a florin, rising to 8s. 3d., and in the "heavy" market, Babcocks at 70s. 6d. have 1s. 9d. to their credit. Falk, Stadelmann strengthened to 42s. 6d. Small rises left Mather & Platt at 51s. 3d. and Strand Electric at 10s. On the other hand, Pye deferred at 25s. are ¼ down. Similar falls lowered Calcutta Electric to 32s. 6d. and Palestine Electric to 28s. 9d. Globe Telegraph & Trust, after their sharp rise, eased off to 45s. Enfield Cables at 34s., are 1s. down and Ever Ready at 35s. 9d. are also easier.

Stock on Offer

Six per cent is the yield on a line of Switchgear & Cowans 5s. ordinary, available in the electrical equipment market at 16s. 7½d. Hackbridge Cable ordinary are back to the issue price of 15s. 6d., at which the return on the prospectus estimates is £6 9s. per cent; the preference stand at 23s. 9d. Both can still be bought free of transfer stamp, the former until the 20th, and the latter until the end, of this month. Hackbridge & Hewittic 5s. ordinary are available in fair numbers at 11s., giving a prospective 5½ per cent on the money. Heatrae 2s. shares do not often come into the market, but 2,500 are currently offered at 6s. to yield just on four guineas per cent. Among preference stocks, Sterling Cable 4½ per cent redeemable shares can be bought at 20s. 6d. and Scottish Cable 4½ per cents at 23s. 6d. Brush 5½ per cents are offered at a guinea, the return being £5 4s. 9d. per cent.

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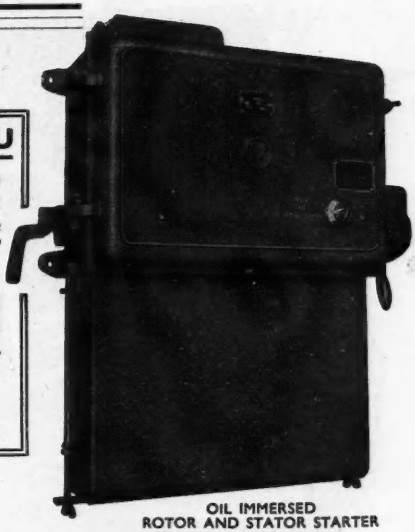

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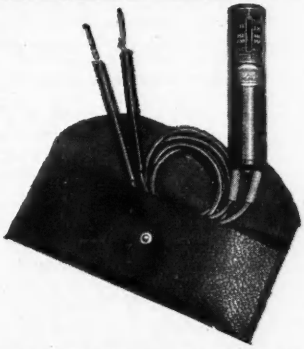

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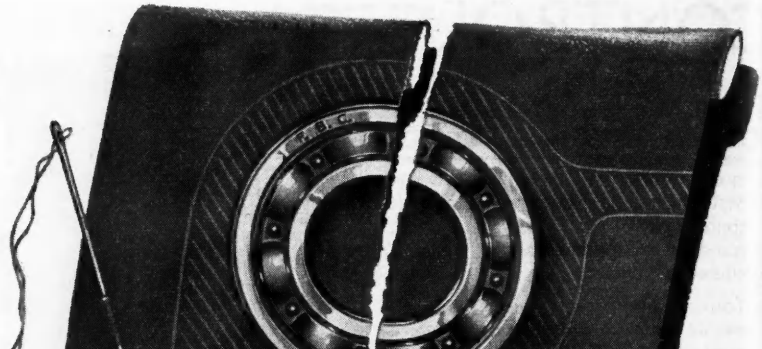

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Electricity Supply

Bradford Smoke Abatement Proposal. Caithness Development Scheme.

Birmingham. — FUEL ECONOMY DEVICE. — Public clocks are being painted red between the figures 8 to 10 and 4 to 6 as a reminder to people to save electricity during peak periods.

Bradford.—PROPOSED COAL FIRE BAN.—Among the 80 to 90 ideas compiled by the town clerk (Mr. W. H. Leathem) from suggestions by departmental officials and approved by the Parliamentary Sub-committee of the City Council last week for submission to the Finance Committee, the most controversial proved to be plans to obtain powers to ban coal fires in the city centre in order to reduce the smoke nuisance. The sub-committee also recommends that powers be sought to create a district heating undertaking. If these plans are adopted by the City Council they will form part of the clause of a Parliamentary Bill and will eventually be submitted to a town's meeting. The opponents of the proposal to prohibit the use of coal in zone by zone of the city pointed out the inconvenience this would cause to hundreds of people and put them to great expense. The objection, however, was overruled.

London.—L.C.C. APPROVES BOILER HOUSE.—The London County Council has given consent to the erection of the main boiler house building at the Blackwall Point power station, Greenwich, with vertical enclosure to a greater height than that prescribed by the London Building Act 1930.

North of Scotland.—CAITHNESS DEVELOPMENT. —The North of Scotland Hydro-Electric Board announced last week a programme of electrical development for Caithness which will include the provision of an electricity supply to John O'Groats. As a first stage an additional 300-kW diesel generating set will be installed in the Thurso power station. A transmission line to be erected between Thurso and Wick will serve places between the two towns. Distribution lines from Wick are to be extended north to Keiss and south to Lybster and tenders have been invited for the work. Two 240-kW diesel generators have been installed in the Wick station, and another two sets of 520 kW and 600 kW are in course of installation.

Totnes.—COOKERS IN COUNCIL HOUSES.—Some of the solid-fuel cooking stoves in houses of the Totnes Rural District Council are in a bad state of repair and the housing manager suggested that in future the Council should consider replacing such stoves by electric cookers which would allow space for the installation of an open fire in the living room. The extra cost of electric cooker and open fire over a new solid-fuel stove would be about £12 and he recommended that tenants should be asked to pay additional rent to meet this. The Council instructed the manager to investigate the matter further.

Tynemouth.—LIGHTING ALTERATIONS.—Substitution of 300-W for 500-W lamps on main traffic routes to allow for the provision of better lighting in side streets is recommended. In back streets there are 52 electric and 264 gas lamps not in use and a certain amount of back street lighting at a cost not exceeding £100 is proposed.

Walthamstow.—DISCOUNTS DISCONTINUED.—Electricity consumers in the borough are losing the 5 per cent cash discount which has been allowed on certain quarterly accounts if paid within 14 days, and on monthly accounts if paid within seven days. Notice of this has been given by the London Electricity Board.

Overseas

Venezuela.—PLANT EXPANSION PROGRAMME.—Details of the plans of the Corporatión Venezolana de Fomento (an autonomous Government organization) to expand the country's generating plant capacity are outlined in the *South American Journal*. Following a survey of requirements made last year, it is proposed to add 600,000 kW of plant in five new generating stations, two hydro-electric and three thermal, the approximate cost being 500 million bolivares (about £37 million). Hydro-electric stations are projected in the Andean region, employing mountain streams, and in the vicinity of the Bajo Caroni, State of Bolivar, utilizing falls. Petroleum and fuel gas would be used for thermal stations between Cumana and Higuerate; near Sabana de Mendoza on the shores of Lake Maracaibo; and near Ciudad Bolivar on the shores of the Orinoco River. Two thermal stations at present under construction at La Cabrera on Lake Valencia are expected to be in operation early next year. A private concern, La Electricidad de Caracas, has under consideration a scheme for the construction of a thermal plant at Arrecife with an ultimate capacity of 100,000 kW; two 25,000-kW sets would be installed immediately, together with transmission lines to Caracas.

TRANSPORT

Glasgow.—NEW EQUIPMENT.—Mr. E. R. L. Fitzpayne, manager of the Corporation Transport stated at an inquiry into the city's application to increase fares, that orders totalling £1,186,000 had been placed for new equipment, including £686,000 for new tramcars, £9,500 for boilers, and £2,065 for switchgear.

Liverpool.—BUSES TO REPLACE TRAMS.—Preparations are being made by the Passenger Transport Department for the conversion of two further tram routes to bus operation.

Swiss Electrical Imports

INCREASES IN MOST GROUPS

WHILE the Swiss electrical export trade in 1947 showed a big advance (see the *Electrical Review* of 24th September) there was also an increase in the country's import trade compared with 1946. The values of the main items, extracted from the Swiss official statistics, are given below with countries of origin and notes of increases or decreases. Virtually all groups except accumulators and insulators went ahead. (17 Swiss francs = £1).

Sources of Imports	1947 Fr. (000)	Inc. or dec. on 1946 Fr. (000)
Accumulators	894	− 56
From United States	315	+ 213
„ *France*	255	+ 93
„ *Sweden*	196	− 406
Insulators	697	− 275
From France	77	− 160
„ *Denmark*	483	− 157
Meters and measuring instruments	2,157	+ 909
From United States	1,255	+ 644
„ *France*	211	− 3
„ *Britain*	302	+ 159
Radio apparatus	15,579	+ 6,526
From Britain	1,692	+ 495
„ *Holland*	4,165	+ 1,411
„ *France*	484	− 208
„ *United States*	6,979	+ 4,311
Telegraph and telephone apparatus	7,656	+ 2,697
From Belgium	4,305	+ 1,236
„ *Britain*	987	− 560
Glass rectifiers with or without mercury	168	+ 52
From Holland	81	− 9
Insulated wire and cable	1,173	+ 758
From Holland	138	+ 71
„ *Belgium*	401	+ 175
„ *Britain*	96	+ 21
„ *United States*	210	+ 193

Sources of Imports	1947 Fr. (000)	Inc. or dec. on 1946 Fr. (000)
Unspecified electrical apparatus over 500 kg	43	− 83
From France	12	− 108
Ditto 50 to 500 kg	362	+ 242
From Holland	76	+ 21
„ *Britain*	32	+ 13
„ *United States*	177	+ 161
Ditto 3 to 50 kg	370	+ 227
From United States	125	+ 83
„ *Sweden*	32	+ 7
„ *Britain*	37	+ 17
Ditto under 3 kg	2,393	+ 1,083
From Italy	458	+ 290
„ *Holland*	788	+ 224
„ *Belgium*	220	+ 11
„ *France*	116	+ 13
Dynamo-electric machines	9,541	+ 6,268
From Czechoslovakia	2,176	+ 542
„ *Italy*	2,347	+ 1,811
„ *France*	598	+ 345
„ *United States*	2,216	+ 1,866
Lighting and starting equipment for vehicles	3,210	+ 2,203
From France	460	+ 235
„ *United States*	1,624	+ 1,233
Electric incandescent lamps	6,052	+ 2,221
From Hungary	652	+ 255
„ *Holland*	4,385	+ 1,414
„ *United States*	640	+ 522

Australian Notes

From Our Own Correspondent

GOOD progress is being made with the enlargement of the Victorian State Electricity Commission's power station at Newport to its ultimate capacity of 198,000 kW. The last two generators and four boilers are being erected. Under the State Electricity Commission Bill passed by the State Parliament in July, authority is granted for the transfer to Commission ownership and administration of the 95,500-kW Newport "A" station, which is at present owned and controlled by the Victorian Railways.

The installed capacity of the Lithgow power station operated by the New South Wales Railways has been increased by a 7,500-kW set manufactured by Metropolitan-Vickers, and orders have been placed for two others.

No Tram Services on Sundays.—In order to reduce the consumption of electricity, Sydney and Newcastle are now having "tramless" Sundays.

Higher Sales of Electrical Goods.—Leading Sydney stores report that electrical goods remain far ahead of all others in increased sales. In April the sale of electrical goods was up by 113·4 per cent compared with a year before, stocks at the end of the month being 67·6 per cent higher.

Commission Buys Ship.—The Victorian Electricity Commission has bought the coastal ship *Uralba* (600 tons) for £30,000 in an attempt to overcome building supply shortages which are hampering its extension work.

"Management Abstracts"

WE have received from the British Institute of Management, 17, Hill Street, London, W.1, the first issue of "Management Abstracts" which it is proposed to publish monthly at 3s. a copy (annual subscription 30s.). The new publication is a digest of material published in all parts of the world bearing on all aspects of management and organization. Headings include such subjects as works management, personnel and welfare, financial management, distribution, supplies, transport, statistics, public administration, and education and training.

NEW PATENTS

Electrical Specifications Recently Published

The numbers under which the specifications will be printed and abridged are given in parentheses. Copies of any specification (1s. each) may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2.

1939

BERLIN Akt.-Ges. für Elektrische Industrie.—"Process of automatic arc welding using coated electrodes and device for use therewith." 15025. 27th December, 1938. (Cognate application 15026/39.) (608484.)

Soc. Anon. des Cableries & Trefileries.—"Flexible tubular electric conductors." 17436. 14th June, 1938. (608485.)

1944

British Thomson-Houston Co., Ltd.—"Control systems for synchronous condensers." 6189. 5th April, 1943. (608489.)

F. B. Dehn (Globe-Union, Inc.).—"Electric capacitors and dielectric for same." 14020. 21st July, 1944. (608579.)

1945

G. B. Banks.—"Igniters for mercury arc-discharge tubes." 5835 8th March, 1945. (608589.) "Mercury-arc discharge devices of the kind having a mercury-pool cathode." 5986. 9th March, 1945. (608590.)

British Thomson-Houston Co., Ltd., and A. Bowen.—"Safety shutters for kinematograph projectors." 9545. 17th April, 1945. (608491.)

W. A. Johnson, A. Rawling and A. L. Cullen.—"Wave guide transmission of electromagnetic waves." 17641. 10th July, 1945. (608494.)

H. E. Pancher.—"Electric rotor and method of making the same." 18327. 17th July, 1945. (608495.)

British Thomson-Houston Co., Ltd.—"High-frequency wave transmitting apparatus." 25484. 2nd October, 1944. (608499.)

Aircraft-Marine Products, Inc.—"Electrical interconnectors and terminal blocks incorporating the same." 28515. 27th October, 1944. (608625.)

Wandsworth Electrical Manufacturing Co., Ltd., and T. Batchelor.—"Electric tumbler switches." 30424. 14th November, 1945. (608504.)

Marconi's Wireless Telegraph Co., Ltd.—"Radio object-detection and object-location systems." 32051. 28th February, 1939. (608632.)

Soc. Anon. de Télécommunications.—"Terminal installation for multiplex carrier-current telephony." 32760. 6th August, 1942. (608634.)

Westinghouse Electric International Co.—"Arc welding control systems." 33913. 10th August, 1944. (608636.)

Bendix Aviation Corporation.—"Resistance pile electric regulators." 34166. 27th December, 1944. (608508.)

Speed Marketing Co. (Sussex), Ltd., and R. C. Fuller.—"Fluid-pressure operated switches." 34472. 19th December, 1945. (608669.)

Warner & Swasey Co.—"Electric surface speed indicator." 35048. 14th December, 1944. (608670.)

1946

English Electric Co., Ltd., W. G. Jowett, E. A. Binney and J. H. Abbink-Spaink.—"Charging of electric batteries." 1297. 14th January, 1946. (608673.)

F. C. Stephan and R. F. Egginson.—"Electrical terminals." 3568. 5th February, 1946. (608645.)

General Electric Co., Ltd., and J. T. Caldwell.—"X-ray apparatus." 3741. 6th February, 1946. (608646.)

H. L. Lambert.—"Centrifugal electric switches." 5194. 19th February, 1946. (608309.)

D. Napier & Son, Ltd., and F. R. F. Ramsay.—"Electrical ignition systems." 5255. 20th February, 1946. (608324.)

General Electric Co., Ltd., and L. A. Dauncey.—"Apparatus for locating leaks in pipe lines, fluid-filled electric cables and the like." 5299. 20th February, 1946. (608331.)

Westinghouse Electric International Co.—"Magnetic core structures for electrical induction apparatus." 5452. 3rd March, 1945. (608378.)

Standard Telephones & Cables, Ltd.—"Marker selection control systems such as are used in automatic telephone systems." 5484. 21st February, 1945. (Cognate application 5485/46.) (608388.)

J. Lucas, Ltd., and E. A. Watson.—"Electric lighting apparatus for use in explosive atmospheres." 5488. 21st February, 1946. (608391.)

W. Clark.—"Electric switches." 5545. 22nd February, 1946. (608398.)

Naamlooze Vennootschap Philips' Gloeilampenfabrieken.—"Dynamo-electric machines." 5575. 21st May, 1941. (608408.)

Philips Lamps, Ltd.—"Circuit arrangement adapted to be fed from a low voltage battery or from a mains supply." 5581. 9th June, 1941. (608409.) "Adjustable resistances for use at high-frequencies." 5582. 18th June, 1941. (608410.)

Standard Telephones & Cables, Ltd.—"Arrangement for automatically changing-over defective equipment to a spare equipment." 5613. 10th May, 1944. (608417.)

M. Widakowich.—"Arrangement for feeding gas or vapour discharge lamps with direct current." 5621. 22nd February, 1946. (608418.)

Siemens Bros. & Co., Ltd., and H. S. Double.—"Automatic voltage control of electric convertors." 5636. 22nd February, 1946. (608423.)

Singer Manufacturing Co.—"Bearing assembly for dynamo-electric machines." 5656. 23rd April, 1945. (608425.)

Singer Manufacturing Co.—"Dynamo-electric machine." 5657. 23rd April, 1945. (608426.)

F. W. Gough.—"Coal and electric fires." 5676. 22nd February, 1947. (608652.)

J. R. Lister.—"Electric ceiling fittings." 5711. 23rd February, 1946. (Cognate application 35098/46.) (608443.)

Singer Manufacturing Co.—"Brush holder assembly for dynamo-electric machines." 5723. 23rd April, 1945. (608449.) "Dynamo-electric machine with integral connector box." 5724. 23rd April, 1945. (608450.)

J. Lucas, Ltd., H. Silman and W. Stein.—"Electrodeposition apparatus." 5768. 25th February, 1946. (608462.)

Standard Telephones & Cables, Ltd.—"Class of service discrimination in telecommunication exchange systems, 5791. 27th March, 1945. (608466.)

Standard Telephones & Cables, Ltd., P. K. Chatterjea and J. K. Beney.—"Demodulation of time-phase modulated electric pulses." 5792. 25th February, 1946. (608467.)

General Electric Co., Ltd., J. C. Adams and H. J. A. Turner.—"Runway contact lights." 5796. 25th February, 1946. (608469.)

General Electric Co., Ltd., and F. J. Keeley.—"Electric switches and contacts therefor." 5797. 25th February, 1946. (608470.)

M-O. Valve Co., Ltd., T. F. B. Hall and G. V. H. Freeman.—"Electric-discharge devices." 5798. 25th February, 1946. (608471.)

Det Norske Aktieselskab for Elektrokemisk Industri.—"Treatment of the charge in an electric smelting furnace." 5813. 9th May, 1939. (608474.) "Self-baking electrodes for electric furnaces." 5814. 13th June, 1941. (608475.)

British Thomson-Houston Co., Ltd. (General Electric Co.).—"Bladed rotors for turbines or the like." 5820. 25th February, 1946. (608476.)

Metropolitan-Vickers Electrical Co., Ltd., W. K. Buchanan and W. Simpson.—"Preparation of anhydrous normally-liquid ethers for use more particularly in the production of silicone intermediates." 5823. 25th February, 1946. (608478.)

Sperry Gyroscope Co., Inc.—"Attenuators for high-frequency electromagnetic energy." 5834. 24th February, 1945. (608481.)

Automatic Telephone & Electric Co., Ltd., C. R. Woodland and E. I. Houghton.—"Cam operated electric switches." 5914. 26th February, 1946. (608528.)

Elexcel, Ltd., and H. J. McMath.—"Electric fires." 5915. 26th February, 1946. (608529.)

W. Brooke and H. T. Baldwin.—" Control systems for electric motors, and the like." 5944. 26th February, 1946. (608533.)

British United Shoe Machinery Co., Ltd.—" Apparatus adapted for use in the treatment of a workpiece with a high-frequency electrostatic field." 5970. 28th February, 1945. (Cognate application 5971/46.) (608537.)

British Thomson-Houston Co., Ltd. (General Electric Co.).—" Cathode-ray screens and methods of preparing them." 6003. 26th February, 1946. (608546.)

British Thomson-Houston Co., Ltd.—" Internal exhaust seals for electric lamps and similar devices." 6071. 3rd March, 1945. (608676.) " Gas-filled electron-discharge devices." 6072. 3rd March, 1945. (608677.) " Electrodes for electric-discharge devices." 6073. 3rd March, 1945. (608678.)

Ferranti, Ltd., J. R. Whitehead and H. Wood.—" Super-regenerative radio-receivers of the type associated with transmitting means." 6101. 27th February, 1946. (608684.)

M-O Valve Co., Ltd., E. G. James and G. W. Warren.—" Thermionic valves." 6123. 27th February, 1946. (608691.)

General Electric Co., Ltd., and D. A. Boyland.—" Hollow rotors and centrifuges." 6125. 27th February, 1946. (608692.)

Standard Telephones & Cables, Ltd., and F. W. May.—" Electrical contact spring assemblies." 6136. 27th February, 1946. (608696.)

Siemens Bros. & Co., Ltd., and A. Rosen.—" Sealing electric cable ends into casings." 6260. 28th February, 1946. (608722.)

British Thomson-Houston Co., Ltd., and R. F. Weston.—" Quartz or glass to metal seals." 6285. 28th February, 1946. (608726.)

Marconi's Wireless Telegraph Co., Ltd.—" Transmission line arrangements." 6358. 17th January, 1945. (608738.)

Det Norske Aktieselskab for Elektrokemisk Industri.—" Continuous electrode furnaces." 6402. 3rd March, 1945. (608656.) " Contact arrangements for continuous carbon electrodes." 8803. 22nd April, 1944. (608743.)

Ferranti, Ltd., and H. Wood.—" Super-regenerative radio receivers of the type associated with transmitting means." 6797. 5th March, 1946. (608739.)

Philips Lamps, Ltd.—" Electric-discharge tubes." 8418. 8th August, 1941. (608742.)

Sperry Gyroscope Co., Inc.—" Automatic gain-control systems for amplifiers." 8942. 28th March, 1945. (608657.)

Delco-Remy & Hyatt, Ltd., and S. H. Blazey.—" Electric fan." 9394. 27th March, 1946. (608569.)

Philips Lamps, Ltd.—" Magnetrons." 14700. 27th February, 1942. (608744.)

Naamlooze Vennootschap Philips' Gloeilampenfabrieken.—" Flash-light lamps." 16936. 11th April, 1940. (608746.)

1947

British Celanese, Ltd.—" Production of insulating materials." 21680. 3rd February, 1943. (608753.)

Broadcasting Station Guide

THE demand for the *Wireless World* " Guide to Broadcasting Stations " has been such that a fourth completely revised and enlarged edition has been produced. Details of nearly three hundred European medium- and long-wave broadcasting stations and eleven hundred short-wave stations of the world are given in tabular form, geographically and in order of frequency.

In addition the booklet includes the revised list of international call signs, which will be adopted in January, 1949; world time constants; wavelength-frequency conversion table; details of European television and f.m. stations and special service stations. The Guide is published by Iliffe & Sons, Ltd., Dorset House, Stamford Street, London, S.E.1, at 1s. (postage 1d.)

New Factories Act

MOST of the provisions of the new Factories Act came into force on 1st October. A person who proposes to use any premises as a factory must notify the District Inspector of Factories in writing at least a month in advance (instead of, as before, up to a month after the factory has started). The requirement applies also to shopkeepers who propose to use their premises for purposes which would make them a factory. The notice must indicate the nature of the work, and whether mechanical power is to be used, and if so its nature. Similarly, at least a month's notice must be given before mechanical power is first used in any factory.

In future, when youths or girls under eighteen are taken into any employment in a factory, they must not remain in that job for more than a fortnight unless certified fit for it by a doctor appointed by the Factory Department. (Hitherto, this requirement has only applied to boys and girls under sixteen.) Young people already employed in a factory are not affected so long as they remain in the same employment. The requirements are extended to cover employment in building and civil engineering, and in repairing, refitting, painting and certain other work on ships in harbour or wet dock.

Owners of buildings partly let off as factories have some additional obligations, and there are some amendments in the precautions required where, in a factory, people have to enter tanks, pits, pipes or other confined spaces in which they may be overcome by fumes or lack of proper air.

Purchasing Officers' Association

ADDRESSING members of the Purchasing Officers' Association at their recent annual conference at Cheltenham, Mr. T. F. Turner (chief purchasing agent, English Electric Co., Ltd.), the retiring national chairman, reported that the Association now had nineteen branches and groups in Great Britain, with a membership of over 1,600 practising industrial and governmental purchasing officers; this was an increase of over 33⅓ per cent in a year.

The main object of the Association is to raise the status of the purchasing officer commensurate with his responsibility for the largest proportion of an industrial organization's expenditure.

Through its education scheme, which during the year has been brought into line with the recommendations of the Urwick Committee on Education for Management, the Association provides students and junior members with the opportunity of equipping themselves for higher responsibilities. It has an appointments register, at its head office, 17/18, Henrietta Street, London, W.C.2.

Mr. F. O. Ashmore (Calico Printers' Association, Ltd.) has been elected president for 1948-49.

CONTRACT INFORMATION

ACCEPTED TENDERS AND PROSPECTIVE ELECTRICAL WORK

Contracts Open

Where "Contracts Open" are advertised in our "Official Notices" section the date of the issue is given in parentheses.

Brentford.—British Overseas Airways Corporation. Engine driven generator sets. (See this issue.)

Cleethorpes. — 30th October. Corporation Transport Department. Mercury-arc traction rectifier equipment. (See this issue.)

Gateshead.—Education Committee. Electrical installation in kitchen-dining halls at the Shipcote and King Edward Street Schools. R. W. Gregory and Partners, Pilgrim House, Newcastle-on-Tyne.

Manchester. — 11th October. Education Committee. Electrical installation at the Baguley Hall Primary School, Wythenshawe. (1st October.)

South Africa. — JOHANNESBURG. — 19th October. L.v. kiosk distribution boards and h.v. link cabinets. (E.P.D. 41180/48. Com./961.)*

PRETORIA.—4th November. Department of Posts and Telegraphs. Magneto extension bells, telephones and telephone switchboards. (E.P.D. 40859/48. Com./949.)*

DURBAN.—24th November. City Electricity Department. Cable and jointing material. (E.P.D. 41281/48. Com./984.)*

Uruguay.—MONTEVIDEO.—29th October. Administracion Nacional de Puertos. One long wave radio transmitting set, and one short wave receiving set. (EPD. 40918/48. Com./937.)*

8th November. Usinas Electricas y Telefonos del Estado. Lead-covered conductors. (E.P.D. 41213/48. Com./983.)*

* Specifications may be inspected at the Export Promotion Department, Thames House North, Millbank, S.W.1.

Orders Placed

Folkestone.—Corporation. Accepted. Electrical installations in 28 houses on the Horn Street site. (£1,115).—Modern Electrics.

Northumberland. — Education Committee. Accepted. Overhauling electrical installation at the Alnwick Duke's School. (£1,575).—I. and E. Morton.

South Shields. — Town Council. Accepted. Electric lighting installation for proposed civic restaurant at the South Foreshore. (£142).—A. J. Wares.

Swansea.—Corporation. Accepted. Electrical installation in 220 houses—Alpha Manufacturing & Electrical Co., Ltd.

Contracts in Prospect

Particulars of new works and building schemes for the use of electrical installation contractors and traders. Publication in this section is no guarantee that electrical work is definitely included. Alleged inaccuracies should be reported to the Editors.

Amble.—Factory for Hardy Brothers, Ltd., Alnwick; factory and workshop, Byron Street, for Ballantyne & Son.

Arbroath.—Maternity block and nurses' home extension at Infirmary (£140,000); medical superintendent.

Bedlington.—Electrical installations in 47 houses; W. Hall, surveyor, U.D.C. Offices.

Boldon (Co. Durham).—Alterations to electrical installations at three ex-Army camps now used as houses; N. Hindmarch, U.D.C. surveyor.

Bridgwater (Somerset).—Junior school, Bath Road; R. O. Harris, Somerset county architect, Park Street, Taunton.

Burton-on-Trent.—Houses (155), Manners site, Winshill; borough engineer.

Castleside.—Factory estate (six factories); E. G. Lediard, engineer, 3, Eldon Square, Newcastle-on-Tyne.

Cheadle and Gatley.—Houses (600), Councillor Lane, Cheadle, for U.D.C.; surveyor, Council Offices, Bruntwood Hall.

Cheshunt.—Houses (56), Bury Green estate, for U.D.C.; Clifford Tee & Gale, architects, 153, Moorgate, E.C.2.

Chesterfield.—Extensions to factory; Lamp Caps, Ltd., Sheffield Road.

Coventry.—Houses (147), Lupton Road and Brayford Avenue, Stivichall estate; D. E. E. Gibson, city architect, 1a, Warwick Row.

Crewe.—Houses (140), Middlewich Street; borough engineer.

Darwen.—Nursery school, Blackburn Road; G. Ashton, borough surveyor, Municipal Building.

Durham.—Technical school, Spennymoor, and modern school, Ferryhill, for the C.C.; county architect, Court Lane.

Edinburgh.—Houses (112), Saughton Mains, and flats (88), Gorgie; town clerk, City Chambers.

Ely.—Offices for River Great Ouse Catchment Board; Kerridge (Cambridge), Ltd., Surton Street, Cambridge, builders.

Eyemouth.—Additions and alterations to High School, with electrical work, for Berwickshire C.C.; R. J. Johnston, county clerk, Duns.

Ferry Bridge.—Factory for Pollard Bearings (Birmingham), Ltd.; F. & C. Leach, builders, Park Lane, Pontefract.

Gateshead.—Kitchen dining room at the Whitehall Road School, and electrical installation at the kitchen-dining halls at the Shipcote and King Edward Street Schools; H. J. Cook, chief architect.

Greenock.—Houses (48) for police personnel; city surveyor.

Hebburn-on-Tyne.—Houses for U.D.C.; builders (22 houses each), J. M. Black, Ltd., Gustavus Bailey, Ltd., South Shields, Cussins, Ltd., Newcastle, and W. Hall, Ltd., Gateshead.

Houghton-le-Spring.—Houses (138) for U.D.C.; V. Hunter, surveyor, U.D.C. Offices.

Hyde.—Factory, John Street; South Lancashire Press Tool Co., Ltd., 56, Manchester Road West, Little Hulton, Bolton.

Kilmarnock.—Secondary school for county council (£221,000); county architect, Ayr.

Kington-on-Thames.—Housing estate, Tudor Drive; G. T. Crouch, Ltd., builders, 3/5, Thames Street.

London.—CLAPHAM.—Dwellings (232), Notre Dame Estate, for Wandsworth B.C.; C. H. James, architect, 5, Bloomsbury Street, W.C.1.

FOREST GATE.—Rebuilding confectionery factory, Belton Road; E. K. Conyngham, architect, 77, Cecil Park, Pinner.

WESTMINSTER.—Office block, 5/11, Regent Street; Wimperis, Simpson & Guthrie, architects, 61, South Molton Street, W.1.

Lowestoft.—Commercial garage, Mariners Parade; W. B. Cooper & Co., Ltd., 13, Mariners Street.

Houses (50), Yarmouth Road; borough engineer.

Malton.—County secondary school for North Riding E.C.; J. Catchpole, county architect, County Buildings, Northallerton.

Manchester.—Transport garage and office, Sherborne Street, Strangeways, for G. Massey & Sons; F. Whiteley, architect, Bank Buildings, Bank Street, Wilmslow, Cheshire.

Perth.—Nurses' training unit and extension to nurses' home at Royal Infirmary (£73,500); medical superintendent.

St. Leonards-on-Sea.—Garage, service station and showrooms, Warrior Square; Coombs Motors, Ltd., 19, Norman Road.

New wing to nurses' home, Buchanan Hospital; Henry Ward & Son, architects, 8, Bank Buildings, Hastings.

Stafford.—Houses (44), Rising Brook estate; T. H. Higson, borough surveyor, Borough Hall.

Stockton-on-Tees.—Grammar school at Oxbridge Avenue; Allen & Hill, quantity surveyors, Tankerville Terrace, Jesmond, Newcastle-on-Tyne.

Stubbington.—Houses (42), Mays Lane; surveyor to Fareham U.D.C., Westbury Manor, Fareham.

Sunderland.—School for subnormal children at Southwick; education architect, Ryhope Road.

Tynemouth.—Workshops for the Tyne Commission; Marshall & Tweedy, architects, Grainger House, Blackett Street, Newcastle-on-Tyne.

Factory, Collingwood View, for Cold Rolling Mills, Ltd., Lime Street, Newcastle-on-Tyne.

Wallingford.—New buildings at Berkshire Mental Hospital; county architect, 35, Bath Road, Reading.

Warrington.—County primary school, Dallam Farm estate; J. Y. Hughes, borough surveyor, Municipal Buildings, Bank Park.

Watford.—Houses (70); borough engineer. Factory, Watford By-pass, for Lapointe Machine Tool Co., Ltd., Edgware; Welch & Lander, architects, 38, Gloucester Place, London, W.1.

West Hartlepool.—Primary and secondary modern schools at Rift House for the E.C.; S. M. Richmond, borough architect, Town Hall.

Whitley Bay.—Shopping centre for the Seatonville neighbourhood unit; E. Roberts, U.D.C. surveyor.

Wigan.—Houses (86) on Norley Hall estate (£97,073); D. M. McKellen, borough engineer, Municipal Buildings, Library Street.

Worksop.—Factory for Bairns-Wear, Ltd., Nottingham; T. Cecil Howitt & Partners, architects, St. Andrews House, Mansfield Road, Nottingham.

Worsley.—Houses (600), Manchester Road, Little Hulton, for U.D.C.; W. Thorpe & Hirst Smith, architects, 66, Deansgate, Manchester, 3.

Trade Marks

APPLICATION has been made for the registration of the following trade marks. Objections may be entered within one month from 29th September:—

MORPHY-RICHARDS. No. 658173. Class 9. Electric flat irons, gramophone pick-ups and electric chimes for doors. No. 671615. Class 10. Electric warming pads for beds. No. 671616. Class 11. Electrically operated space heaters and electric pokers.—Morphy-Richards, Ltd., St. Mary Cray, Kent.

MULTIMAX. No. 661764. Class 9. Electric batteries.—Holsun Batteries, Ltd., 137, Victoria Street, London, S.W.1.

KEYNOTE. No. 663103. Class 9. Domestic electric cleaning apparatus, electric flat irons and electric cooking utensils included in Class 9. —Littlewoods Mail Order Stores, Ltd., Waterloo Buildings, Cases Street, Liverpool, 1.

ADCOLA. No. 663976. Class 9. Electrical apparatus and instruments included in Class 9.—Adcola Products, Ltd., Alliance House, Caxton Street, London, S.W.1.

FROMOPRENE. No. 656957. Class 17. Resin-bonded board faced with synthetic rubber for electrical insulating purposes. — Wallington Weston & Co., Ltd., Vallis Mills, Vallis Road, Frome, Somerset.